



THE NETHERLANDS MILITARY AVIATION REGULATIONS

Unmanned Aircraft Systems Acceptable Means of Compliance & Guidance Material

NLD-MAR-UAS AMC & GM

Version number	1.0
Version date	01 March 2026
DefDoc number	MINDEF20260013104

**MILITARY AVIATION AUTHORITY
THE NETHERLANDS (MAA-NLD)**

Status page

Version	Issue date	Change content	Affected pages
1.0	01-03-2026	-	All

Notes:

1. This AMC and GM for the NLD-MAR-UAS document is a derivative from Commission Delegated Regulation (EU) 2019/945 and Commission Implementing Regulation (EU) 2019/947 and is kept as close as possible to the original text. Additions, changes or deletions are applied by the MAA-NLD based on military operational specificities. Military operational specificities are supported by specific national legislation, NATO Standardisation Agreements (STANAGs) and/or internal documents of the Netherlands Ministry of Defence.
2. The following choices were made whilst creating this AMC/GM for the NLD-MAR-UAS:
 - a. EASA Acceptable Means of Compliance are used verbatim if the applicability is identical in the military context;
 - b. EASA AMC are deleted when there is no relevance in the military context, as long as it has no adverse effect on the level of safety and interoperability. Specific military deviations from the EASA AMC are added in this AMC document;
 - c. This AMC and GM of the NLD-MAR-UAS relies on definitions laid down in NLD-MAD-1. Forms, standard scenarios and pre-defined risk assessments referring to in this document are published on the MAA-NLD Intranet and Internet.

TABLE OF CONTENTS

Status page	2
TABLE OF CONTENTS	4
COVER REGULATION	7
AMC1 Article 1 Subject matter	7
AMC2 Article 1(3b) Subject matter	7
GM1 AMC Article 1 (3a) Subject matter	7
GM2 Article 1 (4) Subject matter	7
AMC1 Article 2	8
GM1 Article 2 Annex terms and definitions (2)	8
GM1 Article 2 Annex terms and definitions (4)	8
GM1 Article 2 Annex terms and definitions (6)	8
GM1 Article 2 Annex terms and definitions (10)	9
GM1 Article 2 Annex terms and definitions (11, 12, 16, 17, 22 and 28)	9
GM1 Article 2 Annex terms and definitions (13)	10
GM1 Article 2 Annex terms and definitions (15)	10
GM1 Article 2 Annex terms and definitions (18)	10
GM1 Article 2 Annex terms and definitions (19)	11
GM1 Article 2 Annex terms and definitions (21)	11
GM1 Article 2 Annex terms and definitions (25)	11
GM1 Article 2 Annex terms and definitions (27)	11
GM1 Article 2 Annex terms and definitions (31)	11
GM1 Article 2 Annex terms and definitions (36)	12
GM1 Article 2 Annex terms and definitions (37)	12
GM1 Article 2 Annex terms and definitions (39)	12
GM1 Article 2 Annex terms and definitions (41)	13
GM1 Article 2 Annex terms and definitions (43)	13
AMC1 Article 3 categories of MIL-UAS operations	13
GM1 Article 3 categories of MIL-UAS Operations	14
GM2 Article 3 categories of MIL-UAS Operations	14
GM3 Article 3 categories of MIL-UAS Operations	14
AMC1 Article 4 UAS operations in MIL-UAS-OPEN	14
GM1 Article 4 UAS operations in MIL-UAS-OPEN	14
AMC1 Article 5 UAS operations in MIL-UAS-SPECIFIC cat	15
GM1 Article 5 UAS operations in MIL-UAS-SPECIFIC cat	15
GM1 Article 6 UAS operations in the MIL-UAS-CERTIFIED cat	15
GM2 Article 6 (1) (c) UAS operations in the MIL-UAS-CERTIFIED cat	16
GM3 Article 6 (2) UAS operations in the MIL-UAS-CERTIFIED cat	16
GM4 Article 6 (3) UAS operations in the MIL-UAS-CERTIFIED cat	16
GM1 Article 7 (2c) (2d) Rules and procedures for the operation of MIL-UAS	16
GM1 Article 8 (2) Rules and procedures for the competency of remote pilots	17
GM2 Article 8 (4) Rules and procedures for the competency of remote pilots	17
GM3 Article 8 (5) Rules and procedures for the competency of remote pilots	17
AMC1 Article 9 (1) Minimum age for remote pilots	17
GM1 Article 10 Rules and procedures for airworthiness of UAS	18
GM1 Article 11 Rules for conducting an operational risk assessment	18
GM1 Article 12 (4) Authorizing operations in the 'MIL-UAS-SPECIFIC' category	18
GM2 Article 12 (4) Authorizing operations in the 'MIL-UAS-SPECIFIC' category	18
GM1 Article 13 Cross-border operations or outside the state of registration	19
AMC1 Article 14 (1) Registration of MIL-UAS and MIL-UAS remote pilots	19

AMC2 Article 14 (2) Registration of MIL-UAS and MIL-UAS remote pilots	19
AMC3 Article 14 (3) Registration of MIL-UAS and MIL-UAS remote pilots	19
AMC4 Article 14 (3) Registration of MIL-UAS and MIL-UAS remote pilots	20
GM1 Article 14 (1) Registration of MIL-UAS and MIL-UAS Remote Pilots	20
GM2 Article 14 (2) Registration of MIL-UAS and MIL-UAS Remote Pilots	20
GM1 Article 15 operational conditions for UAS geographical zones	20
AMC1 Article 16 Safety information	21
AMC2 Article 16 Safety information	21

ANNEX A: OPERATIONS IN THE ‘MIL-UAS-OPEN’ AND ‘MIL-UAS-SPECIFIC’ CATEGORIES 22

SUBPART A – Operations in the MIL-UAS-OPEN category 22

AMC1 MAR.UAS.OPEN.010 (1) General requirements	22
AMC2 MAR.UAS.OPEN.010 (2) General requirements	22
AMC3 MAR.UAS.OPEN.020 (3) UAS operations with MC-0	22
AMC4 MAR.UAS.OPEN.010 (5) General requirements	22
AMC5 MAR.UAS.OPEN.010 (8) General requirements	22
AMC6 MAR.UAS.OPEN.010 (9) General requirements	23
GM1 MAR.UAS.OPEN.010 (2) General requirements	23
GM2 MAR.UAS.OPEN.010 (3) General requirements	23
GM3 MAR.UAS.OPEN.010 (9) General requirements	24
GM1 MAR.UAS.OPEN.020 UAS operations with MC-0	24
AMC1 MAR.UAS.OPEN.030 UAS operations with MC-3	24
GM1 MAR.UAS.OPEN.050 (6) Responsibilities of the responsible officer/ manager	24
GM1 MAR.UAS.OPEN.060 (2a) Responsibilities of the Mil Remote pilot	25
GM2 MAR.UAS.OPEN.060 (2e) Responsibilities of the Mil Remote pilot	25
GM3 MAR.UAS.OPEN.060 (2g) Responsibilities of the Mil Remote pilot	25
GM4 MAR.UAS.OPEN.060 (2h) Responsibilities of the Mil Remote pilot	25

SUBPART B – Operations in the MIL-UAS-SPECIFIC category 26

AMC1 MAR.UAS.SPEC.020 (1) Operational declaration	26
AMC1 MAR.UAS.SPEC.040 Issuance of an operational authorisation	26
AMC1 MAR.UAS.SPEC.050 Responsibilities of the MIL-UAS operator	26
GM1 MAR.UAS.SPEC.050 Responsibilities of the MIL-UAS operator	26
AMC1 MAR.UAS.SPEC.100 Use of certified equipment and certified UAS	26

ANNEX B: RULES AND PROCEDURES FOR THE AIRWORTHINESS OF MIL-UAS 27

SUBPART A – Initial and continued airworthiness 27

GM1 MAR.UAS.B.A.010 Design certificates overview	27
GM2 MAR.UAS.B.A.010 Concept development	27
GM1 MAR.UAS.B.A.020 Issue of DCAC	27
GM1 MAR.UAS.B.A.030 Format of DCAC	27
AMC1 MAR.UAS.B.A.040 Design verification process	27
AMC2 MAR.UAS.B.A.040 Using a EASA design verification report	28
AMC3 MAR.UAS.B.A.040 Design verification basis	28

SUBPART B – Technical requirements for military UAS operated in the MIL-UAS-OPEN category 28

AMC1 MAR.UAS.B.B.010 HDBV-014 legacy	28
AMC1 MAR.UAS.B.B.020 Tether tensile length	28
AMC2 MAR.UAS.B.B.020 Lights	28
GM1 MAR.UAS.B.B.020 Direct remote identification	29
GM1 MAR.UAS.B.B.030.(b) Maximum speed	29
GM1 MAR.UAS.B.B.050.(c) Low-speed mode	29

SUBPART C – Technical requirements for MIL-UAS types operated in the MIL-UAS-SPECIFIC category 29

GM1 MAR.UAS.B.C.010 Introduction to robustness	29
--	----

GM1 MAR.UAS.B.C.020 Guidance on design related OSOs	30
GM1 MAR.UAS.B.C.030 Mitigation measure M2.1 'reduced effects of UA impact dynamics'	32
AMC1 MAR.UAS.B.C.040 Ground risk buffer containment	33
SUBPART D – Design Conformity Assessment Organisation approval	33
AMC1 MAR.UAS.B.D.020 Eligibility	33
AMC1 MAR.UAS.B.D.120.(d) Determination of unsafe conditions	33
SUBPART E – Continuing airworthiness	34
AMC1 MAR.UAS.B.E.030 Repairs	34
ANNEX C: REMOTE PILOT COMPETENCIES	35
SUBPART A – Competency requirements in category MIL-UAS-OPEN	35
AMC1 MAR.UAS.C.A.010 (b) Theoretical competencies	35
GM1 MAR.UAS.C.A.010 (b) Theoretical competencies	37
AMC1 MAR.UAS.C.A.020 Practical competencies	37
GM1 MAR.UAS.C.A.020 Practical competencies	38
SUBPART B – Competency requirements in category MIL-UAS SPECIFIC	40
AMC1 MAR.UAS.C.B.010 (1) general	40
GM1 MAR.UAS.C.B.010 (1) general	40
AMC1 MAR.UAS.C.B.020 (a) UAS operations in MIL-UAS SPECIFIC	40
AMC1 MAR.UAS.C.B.020 (b) UAS operations in MIL-UAS SPECIFIC	42
AMC2 MAR.UAS.C.B.020 (b) UAS operations in MIL-UAS SPECIFIC	43
AMC3 MAR.UAS.C.B.020 (b) UAS operations in MIL-UAS SPECIFIC	43
ANNEX D: SPECIFIC OPERATIONS RISK ASSESSMENT (SORA)	45
AMC1 Subpart A General	45
AMC2 Subpart A General	45
GM1 Subpart A General	45
GM2 Subpart A General	46
GM1 MAR.UAS.D.B. 010 Step #1 - ConOps description	46
GM1 MAR.UAS.D.B. 020 Step #2 – Determination of the intrinsic ground risk class	47
GM2 MAR.UAS.D.B. 020 Step #2 – Determination of the intrinsic UAS ground risk class	48
GM1 MAR.UAS.D.B. 030 Step #3 - Final GRC determination	48
GM1 MAR.UAS.D.B. 040 Step #4 - Determination of the initial Air Risk Class (ARC)	48
AMC1 MAR.UAS.D.B. 050 Step #5 Strategic mitigations to determine the residual ARC	49
GM1 MAR.UAS.D.B. 050 Step #5 - Strategic mitigations to determine the residual ARC	49
GM1 MAR.UAS.D.B.080 Step #8 Identification of the Operational Safety Objectives	49
GM1 MAR.UAS.D.B.090 Size of the adjacent area	51
AMC1 Step #10 Comprehensive safety portfolio	51
Final Clauses	52

COVER REGULATION

AMC1 Article 1 Subject matter

For the purposes of the Regulation, the term 'operation of unmanned Aircraft systems' does not apply to UAS operated indoors. Indoor operations are operations that occur in a building or, more generally, in a closed space such as a cargo bay of a ship, a silo or a mine where the likelihood of a UA escaping into the outside airspace is very low. Indoor UAS operations over assemblies of people e.g. inside a closed sport stadium are not allowed.

AMC2 Article 1(2) Subject matter

According to Mil AIP GEN 1.6.1.3, other Nation's military UAS operated by non-NLD MOD personnel shall ask the MAA-NLD for recognition of its own certificates or authorisations for the purpose of operating within the NLD. Prior to any recognition of these documents, the MAA-NLD will first ensure that those documents provide an acceptable level of safety as their NLD equivalents.

GM1 AMC Article 1 (2) Subject matter

This NLD-MAR-UAS does not apply to:

- (a) Civil Registered, Civilian-Owned or Civilian Operated UAS not operating under contract of the MOD within Military Airspace or from military infrastructure;
- (b) Other Nation's military UAS operated by non-NLD MOD personnel.

There may be occasions where the Ministry of Defence wishes to utilise civil-registered UAS contracted to the MOD, to achieve its task without placing them in the Military Aircraft Register (EMPIC). In such situations, the regulatory responsibilities of the MAA-NLD and the Civilian Aviation Authority (CAA-NLD) require a clear division between tasks and responsibilities of the military authority and its civil counterpart.

Before entering into any contractual agreement, MOD organisations planning to use civil-registered UAS for military tasks/activities should contact the MAA-NLD to discuss the requirement for a joint MAA/CAA regulatory framework. The MAA-NLD may categorise civil UAS into a different category than that submitted by the CAA-NLD if deemed appropriate.

When authorised by the MAA-NLD to do so, the MOD organisation is permitted to utilise UAS and/or remote pilots on an individual contract basis. In doing so, the MIL-UAS operator maintains responsible officer for the safety of the operation and for ensuring that the competence and obligations of the remote pilot are met in the same way as would be if the contracted remote pilot were an employee of the MIL-UAS operator.

A NLD state organisation involved in public service (e.g. police, firefighting, search & rescue) wishing to bring a UAS and/or RP into service within the MoD or would like to make use of military UAS or RP in its operation fully understands the extent of its proposed usage. This service will require an assessment by the MAA-NLD, which may lead to specific terms and/or conditions for the UAS and/or RP.

GM2 Article 1 (3) Subject matter

MAR's related to and called upon by MAR-OPS 4, MAR-OPS 5, NLD-MAR-M NLD-MAR-145, NLD-MAR-147, NLD-MAR-66, NLD-MAR-FCL, NLD-MAR-MRPL are not applicable for the categories MIL-UAS-OPEN and MIL-UAS Specific. For type certification (categories MIL-UAS-CERTIFIED), the NLD-MAR-21 applies. For maintenance of UAS operated in the

category MIL-UAS-CERTIFIED, the NLD-MAR-M and subsequently the NLD-MAR-145, NLD-MAR-66 and NLD-MAR-147 apply.

Table 01 Overview of the relationship between the NLD-MAR-UAS and other NLD-MAR.

Category of operation	Initial airworthiness	Continuing airworthiness	Operating rules	Remote pilot competencies
MIL-UAS-OPEN	DCAC i.a.w. NLD-MAR-UAS	i.a.w. Subpart E of Annex B of NLD-MAR-UAS	i.a.w. Subpart A of Annex A of NLD-MAR-UAS	i.a.w. Subpart A of Annex C of NLD-MAR-UAS
MIL-UAS-SPECIFIC			i.a.w. Subpart B of Annex A of NLD-MAR-UAS	i.a.w. Subpart B of Annex C of NLD-MAR-UAS
MIL-UAS-CERTIFIED	MTC i.a.w. NLD-MAR-21	i.a.w. NLD-MAR-M	i.a.w. MAR-OPS 4 or MAR-OPS 5	i.a.w. MAR-MRPL or MAR-FCL

AMC1 Article 2

In the event that terms or definitions of the NLD-MAR-UAS conflict with the NLD-MAD-1, the NLD-MAD-1 prevails.

GM1 Article 2 Annex terms and definitions (2)

The employment of UAS airspace observer is not limited to operations covered in MIL-UAS-OPEN or MIL-UAS specific. They can be employed also in other operations under the MIL-UAS-CERTIFIED category. The UAS airspace observer(s) main responsibilities:

- (a) maintain a thorough visual scan of the airspace surrounding the UA in order to identify any risk of collision with any aircraft;
- (b) maintain awareness of the position of the UA through visual contact or through assistance provided by electronic means;
- (c) alert the remote pilot when a hazard is detected and assist where necessary to prevent an accident.

GM1 Article 2 Annex terms and definitions (4)

Assemblies of people have been defined by an objective criterion related to the possibility for an individual to move around in order to limit the consequences of an out-of-control UA. It is up to the judgement and the professional airmanship of the RP to make a decision on when a certain number of people is considered an assembly of people.

Qualitative examples of assemblies of people can be expected at;

- (a) sport, cultural, religious or political events;
- (b) beaches or parks on a sunny day;
- (c) commercial streets during the opening hours of the shops;
- (d) large ceremonial events either civilian or military such as transfer of command.

GM1 Article 2 Annex terms and definitions (6)

An autonomous operation with a UAS is able to conduct a safe flight without the intervention of the RP. It does so with the help of artificial intelligence, enabling it to cope with all kinds of unforeseen and unpredictable emergencies. This is different from automatic operations, where the UA flies pre-determined routes defined by the RP before

starting the flight and the UAS executes it. For an automatic type of UA it is essential that the remote pilot is able to intervene at any time.

Autonomous UA need a level of verification of compliance with the technical requirements that is not compatible with the system put in place for the 'MIL-UAS-OPEN' category. Therefore autonomous operations are not allowed in the 'MIL-UAS-OPEN' category but only in the 'MIL-UAS-SPECIFIC' or MIL-UAS-CERTIFIED category.

Flight phases during which the remote pilot has no ability to intervene in the course of the aircraft, either following the execution of emergency procedures, or due to a loss of the command-and-control connection, are not considered autonomous operations.

GM1 Article 2 Annex terms and definitions (10)

Equipment to control unmanned aircraft remotely means any instrument, equipment, mechanism, apparatus, appurtenance, software or accessory that is necessary for the safe operation of an unmanned aircraft which is not a part of the unmanned aircraft and is not carried on board of that unmanned aircraft.

"CU" is also often called "(Ground) Control Station (GCS)" or "Unmanned Aircraft Systems Control Station/Unit".

GM1 Article 2 Annex terms and definitions (11, 12, 16, 17, 22 and 28)

The '*flight geography*' is the spatially and temporally defined volume of airspace in which the UAS operator plans to conduct the operation under normal procedures; the projection of such volume on the surface of the earth constitutes the '*flight geography area*'. Additionally, the UA positioning errors must be accounted for in the definition of this area.

To cope with abnormal situations (e.g. navigation errors, UA drifting due to wind etc.), the RP should define the '*contingency volume*' as an airspace volume where contingency procedures are applied in order to bring the UA back to a normal situation within the '*flight geography*' (for example, if the UA exits the boundaries of the flight geography, the remote pilot should take actions to pilot the UAS back into the flight geography). If the contingency situation persists, and if available, the remote pilot should activate the flight termination system (FTS); before the UAS exits the contingency volume). The projection of the '*contingency volume*' on the surface of the earth is the '*contingency area*'.

The '*operational volume*' includes the '*flight geography*' and the '*contingency volume*'. To define the operational volume, the RP should consider the position-keeping capabilities of the UAS in a 4D space (latitude, longitude, height, and time).

The accuracy of the navigation solution, the flight technical error of the UAS, as well as the path definition error (e.g. map error) and latencies should be considered and addressed in defining the operational volume. For navigation errors: the RP should take into account that such errors are determined by the interaction of several contributors, like positioning sensors providing position, navigation and flight control systems, system and human latencies, and environment. Therefore, the RP should establish sufficient margins to cater for such errors.

The '*ground risk buffer*' is the area on the surface of the earth surrounding the operational volume, which is defined by the MIL-UAS operator to minimise the risk to third parties on the surface in case the UA leaves the operational volume. The operational volume is the area the UA is expected to impact if a flight termination system (FTS) is triggered in case UA leaves the operational volume.

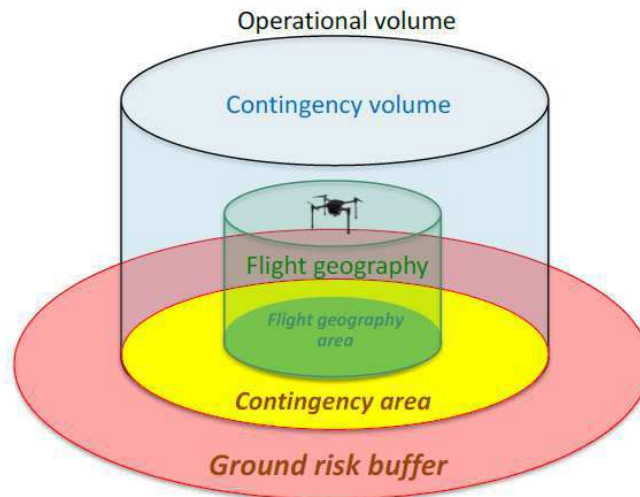


Figure 01— Relation between 'flight geography', 'flight geography area', 'contingency area', 'operational volume' and 'ground risk buffer'.

GM1 Article 2 Annex terms and definitions (13)

For the transport of dangerous goods (DG) by NLD military aircraft the requirements in Subpart MAR-OPS (V. 4.0) Subpart R – transport of dangerous goods apply. This regulation covers construction (design, equipment and testing), risk management, requirements for loading/, documents and packaging (including marking and labelling) of dangerous goods.

If it is the intent to transport DG with a UAS the MIL-UAS operator shall take measures to reduce the risks posed by the product with proper packaging, communication about the content, handling, and stowage.

Lithium batteries as a part of the operational equipment for the operation of the device are not considered DG.

When the intent of using explosives is related to a direct operational purpose (for instance: weapons in order to destroy a target and for one time use only) and not related to transport for logistical reasons, those explosives are considered as weapons and not as DG.

GM1 Article 2 Annex terms and definitions (15)

Unmanned aircraft 'extended visual (trained)' observer(s) must be able to immediately notify the remote pilot of any danger that may prevent the remote pilot to conduct the flight safely. 'Trained' observers means that they have to comply with the separation and collision avoidance responsibilities of the MIL-UAS operator. The UAS extended visual observers should not use aided vision (e.g. binoculars).

GM1 Article 2 Annex terms and definitions (18)

A flight termination system is used to prevent the UAS from leaving the safety margin defined on the ground and accessing the area termed according to the SORA methodology as "adjacent area". Therefore, the use of the FTS is considered as an emergency measure, since prior to its activation the UAS will have crossed the contingency zone and should have applied the corresponding contingency mitigations,

unless the aircraft shows a control failure on the flight geography of the operation and the remote pilot considers its activation.

GM1 Article 2 Annex terms and definitions (19)

In the 'Follow-me' mode the UAS should always be within a 50-meter radius of the RP. Although the "Follow-me" mode could also be used to track another person or vehicle this mode is primarily designed to follow the remote pilot. This requirement means the UAS should never move more than 50 meters away from the remote pilot, unless it is the remote pilot being followed. If the UA exceeds the 50-meter distance from the remote pilot, it must stop its flight and maintain its current position. The UA should not resume flight, even if the object or person it was following approaches the aircraft. The remote pilot must always be able to regain control of the aircraft at any point when in "Follow-me" mode.

GM1 Article 2 Annex terms and definitions (21)

'Controlled ground area' is an area on the ground (on the surface of the earth) where the MIL-UAS operator is able to ensure that only the persons involved are present. Such area comprises the 'flight geography area', the 'contingency area' and the 'ground risk buffer'. The MIL-UAS operator may protect the controlled ground area by means of fencing or using other methods, as appropriate, considering the population density.

GM1 Article 2 Annex terms and definitions (25)

The MTOM is the maximum mass defined by the manufacturer or the builder that ensures the controllability and structural integrity of the UAS when flying within the operational limits.

The MTOM should include all elements on board of the UA:

- (a) all the structural elements of the aircraft; and
- (b) the motor(s); and
- (c) the propellers, if installed; and
- (d) all the electronic equipment and antennas; and
- (e) batteries the maximum capacity of all fluids such as fuel and oil; and,
- (f) the heaviest payload allowed by the manufacturer, including sensors and their ancillary equipment.

GM1 Article 2 Annex terms and definitions (27)

Refer to the NLD-MAD-1 for the definition of the term 'night'. The term 'UDP (uniform daylight period)' is also used. For the Netherlands this is the period based on sunrise and sunset time at 52°00'N 005°00'E from 15 minutes before sunrise until 15 minutes after sunset. The uniform daylight period are depicted in a table described in the Netherlands AIP.

GM1 Article 2 Annex terms and definitions (31)

PDRAs are more flexible than standard scenarios, as they allow the MIL-UAS operator to justify how to meet the scenario requirements. It allows the development of new activities in the sector that are highly specialised and easily adaptable to new aircraft and other technologies.

GM1 Article 2 Annex terms and definitions (36)

For the purpose of this document, a person is only allowed to operate or act as a remote pilot in the operation of one unmanned aircraft at the same time. Swarming operations can be considered as operations with more than one UA in which all air vehicles operate as a unit to commands from one remote pilot, who commands them all through a common link.

Swarming operations are to be considered as 'autonomous' operations and therefore not allowed in the 'MIL-UAS-OPEN' category. All UAS swarm operations must be notified in advance to the MAA-NLD and are subject for approval according to article 11 of the NLD-MAR-UAS.

GM1 Article 2 Annex terms and definitions (37)

Operations with a tethered MIL-UAS can be used as an efficient solution in a number of cases, for example, where an operating area is restricted, or when the required flight time exceeds the normal endurance of a free flying battery powered aircraft. Tethered UAS are subject to the same regulatory framework as all other unmanned aircraft.

The fact that the operation is tethered can be used as a significant mitigation factor when applying for an operating authorisation, thus greatly simplifying the overall process.

If a tethered MIL-UAS can be disconnected during flight this UAS operation shall be classified as a non-tethered operation.

GM1 Article 2 Annex terms and definitions (39)

Due to the variety of possible circumstances and proportional to the military type of UAS and military type of operation this GM only provides general guidelines. An uninvolved person is a person that does not take part in the MIL-UAS operation, either directly or indirectly. Persons may be considered 'involved' when they,

as for military:

- (a) are personnel of the Ministry of Defense of The Netherlands (NLD-MOD); or,
- (b) are personnel under contract of the NLD-MOD and/or non-NLD military personnel as part of the operation in which the MIL-UAS is involved.

as for civilians:

- (a) have given explicit consent to the MIL-UAS operator or to the remote pilot to be part of the MIL-UAS operation (even indirectly as a spectator or just accepting to be overflown by the UAS); or,
- (b) have received from the MIL-UAS operator or from the remote pilot clear instructions and safety precautions to follow in case the UAS exhibits any unplanned behavior; or,
- (c) have entered a military terrain and considered to be aware of the instructions and safety precautions given by the warning signs at the perimeter of a military terrain.

In order to be considered a 'person involved', the person:

- (a) is able to decide whether or not to participate in the MIL-UAS operation;
- (b) has reasonable safeguards during the MIL-UAS operations, introduced by the remote pilot or MIL-UAS operator; and
- (c) is not restricted from taking part in the event or activity if they decide not to participate in the MIL-UAS operation;
- (d) is expected to follow the directions and safety precautions provided, and the MIL-UAS operator or remote pilot should check by asking simple questions to make sure that the directions and safety precautions have been properly understood.

A military terrain is an operational area where are only involved persons present. An area considered to be controlled and enclosed is for example:

- control of access by personnel or electronic means; or,
- physical barrier such as fencing; or,
- signage in place; or,
- no public rights of way through the area.

GM1 Article 2 Annex terms and definitions (41)

The role of the 'unmanned aircraft observer' is to observe the activity of the unmanned aircraft and surrounding airspace while the 'airspace observer' only assist by unaided visual scanning for any potential hazard in the air in the airspace in which the unmanned aircraft is operating. The 'unmanned aircraft observer' can only be used in the 'MIL-UAS-OPEN ' category.

GM1 Article 2 Annex terms and definitions (43)

Visual Line of Sight (VLOS) means a type of UAS operation in which, the remote pilot is able to maintain continuous unaided visual contact with the unmanned aircraft, allowing the remote pilot to control the flight path of the unmanned aircraft in relation to other aircraft, people and obstacles for the purpose of avoiding collisions. Observation is done with the naked eye, without using aids such as binoculars or camera feeds.

AMC1 Article 3 categories of MIL-UAS operations

MIL-UAS shall be categorised following two basic concepts prior to operation:

- (a) Intended use - The type of activity being conducted, and;
- (b) Risk based - The risk to life that the activity presents.

Once the MIL-UAS operator determined the category and its intends to operate, they should accept responsibility for the use of it. Based on categorisation, the MAA-NLD should be informed prior of use of any changes (proposed or actual) to the equipment, operating intent or operating environment of the UAS which has the potential to affect the categorisation. A registration shall be valid for the End Life Type of the UAS provided the conditions specified in the application remain extant.

Where a MIL-UAS operator wishes to expand beyond those conditions, they should resubmit the categorisation submission and an associated safety analysis to the MAA-NLD. A new registration or supplement to the existing registration shall be in place prior to any operation under the new conditions. The MAA-NLD may categorize MIL-UAS into a different category than that submitted if considered appropriate. NLD MIL-UAS waived for registration are;

- (a) MIL-UAS used as air target for training purposes;
- (b) MIL-UAS used as prototypes for research & development purposes;
- (c) MIL-UAS used as a deliverable and for one time purpose only (read as a military application loitering munition).

These MIL-UAS are only allowed to operate within dedicated and/or restricted airspace and under specific conditions designated by the MAA-NLD.

GM1 Article 3 categories of MIL-UAS Operations

MIL-UAS operations are divided into three categories defined as:

- (a) The MIL-UAS-OPEN category of operations covers operations where the risk is mitigated mainly through a combination of operational limitations, requirements for the competence of the remote pilot as well as technical requirements for the UAS;
- (b) The MIL-UAS-SPECIFIC category of operations covers operations where, considering the risks involved, the identification of risk mitigation measures is required through an operational risk assessment performed, using the process and methodology accepted by the MAA-NLD;
- (c) The MIL-UAS-CERTIFIED category of operations covers operations that, considering the risks involved, requires the certification of the UAS, organisation approvals (e.g. design, production, maintenance, operations and training organisation) and, the licensing of the personnel.

GM2 Article 3 categories of MIL-UAS Operations

Differences between 'MIL-UAS-OPEN' and 'MIL-UAS-SPECIFIC';

A MIL UAS operation does not belong to the 'MIL-UAS-OPEN' 'open' category when at least one of the general criteria listed in Article 4 of the NLD-MAR-UAS is not met (e.g. when operating (BVLOS) or when the detailed criteria for a subcategory are not met).

Differences between 'MIL-UAS-SPECIFIC' and 'MIL-UAS-CERTIFIED';

Article 6 of the NLD-MAR-UAS defines the difference between the 'MIL-UAS-SPECIFIC' specific' and the MIL-UAS-CERTIFIED' category. Article 6 (1) (a) defines the difference from an operational perspective, while the Article 6 (1) (b and c) defines the technical characteristics of the UAS

GM3 Article 3 categories of MIL-UAS Operations

The MIL-UAS-CERTIFIED category is for MIL-UAS flights with the highest risk. This category is for flights that may carry the same risks as manned aircraft. A MIL-UAS operation belongs to the 'MIL-UAS-CERTIFIED' category when, based on the risk assessment, the MAA-NLD considers that the risk cannot be mitigated adequately without the:

- (a) certification of the airworthiness of the UAS; and/or
- (b) certification of the MIL-UAS operator; and/or
- (c) licensing of the remote pilot.

AMC1 Article 4 UAS operations in MIL-UAS-OPEN

MIL-UAS operators wishing to operate UAS in a manner or configuration not supported by article 4 (i.e. Concept Test and Evaluation (CD&E) activity) will additionally be subject to an application for the planned activities by the MAA-NLD.

GM1 Article 4 UAS operations in MIL-UAS-OPEN

In the MIL-UAS-OPEN unmanned aircraft up to 25 kg can be used as follows:

- (a) Operations with MC-0 (<250gr) can be conducted within areas that are densely populated or likely to be occupied by large numbers of persons. Flights with a Class MC-0 allows operations over uninvolved people but not assemblies of people. Any overflight of people should be avoided if possible and kept to a minimum;
- (b) Operations with MC-2 can be conducted 'near' people with a minimum horizontal

- distance as set in MAR.UAS.OPEN.030;
- (c) Operations with MC-2 cover the more general types of unmanned aircraft operations. The UA may only be flown in areas where no uninvolved person may be endangered by the UA.

AMC1 Article 5 UAS operations in MIL-UAS-SPECIFIC cat

UAS operations classified in the 'MIL-UAS-CERTIFIED' category (ref. article 6) are not required to obtain an operational authorisation pursuant to Article 12 from the MAA-NLD.

GM1 Article 5 UAS operations in MIL-UAS-SPECIFIC cat

The MIL-UAS-SPECIFIC category covers operations that present a greater risk than that of the MIL-UAS-OPEN category, or where one or more elements of the operation fall outside the boundaries of the MIL-UAS-OPEN category. The key element of the MIL-UAS SPECIFIC category is that the UAS operator is required to hold an operational authorisation, which has been issued by the MAA-NLD. This operational authorisation will be based on the MAA-NLD's evaluation of a safety risk assessment that has been produced by the UAS operator or, in some circumstances, has been 'pre-defined' or 'standardised' and published by the MAA-NLD as a pre-defined risk assessment (PDRA) or Standard Scenario (STS).

An operational authorisation is based on the submitted ConOps. If this ConOps does not change during the MIL-UAS operation, the MIL-UAS operator is allowed to execute its operation within its authorisation.

In order to obtain an operational authorisation, the MIL-UAS operator must conduct a specific operations risk assessment (SORA) of the proposed operation and submit this as part of the application. The SORA is the methodology for the classification of the risk posed by a UA flight in the specific category of operations and for the identification of mitigations and of the safety objectives. With a SORA the applicant indicates:

- (a) the outline of the proposed MIL-UAS operation, ('what' the MIL-UAS operator wants to do);
- (b) a description of the operational process that will be used; ('how' the MIL-UAS operator will do it);
- (c) a description of the technical aspects of the MIL-UAS ('with what' the MIL-UAS operator will do it);
- (d) that the MIL-UAS operation can be done safely (provide a risk assessment/safety case).

Operational authorisation holders are subject to regulatory oversight by the MAA-NLD.

GM1 Article 6 UAS operations in the MIL-UAS-CERTIFIED cat

The MIL-UAS-CERTIFIED category covers operations that present an equivalent risk to that of manned aviation and because of this they are subject to the same requirements. MIL-UAS in the certified category are subject to NLD-MAR-M and MAR-OPS 4 or 5 (depending on the MTOM).

MIL-UAS operations are usually considered to be in the 'MIL-UAS-CERTIFIED' category when they are designed for or to be operated over open-air assemblies of people. This kind of operations may be in the 'MIL-UAS-SPECIFIC' category unless the risk assessment concludes that it is in the 'MIL-UAS-CERTIFIED' category.

MIL-UAS operations involved in the carriage of dangerous goods that may result in a high risk for third parties also includes MIL-UAS to be weaponised. These UAS will either be

certified or will be restricted to operate within designated Danger Areas. UAS designed as a deliverable and for one time purpose only; read as a military application loitering munition, are restricted to operating within designated Danger Areas but are not subject to certification. The determination of the risk for third parties must be agreed on by the MAA-NLD.

Certified MIL-UAS and/or certified equipment may be used for 'MIL-UAS-SPECIFIC' category operations as a means of risk reduction or as a mitigating measure in the risk assessment.

GM2 Article 6 (1) (c) UAS operations in the MIL-UAS-CERTIFIED cat

Any form of ordnance adopted/included/attached to UAS for the purposes of applying a kinetic effect to personnel and/or equipment, is to be classified as 'weaponised'.

GM3 Article 6 (2) UAS operations in the MIL-UAS-CERTIFIED cat

The MAA-NLD shall not grant an operational authorisation when the evaluation concludes mitigating measures that the MIL-UAS operator proposes to keep the MIL-UAS operation safe in all phases of flight are inadequate. If a required high level of robustness to mitigate the risks for third parties in case of an accident cannot be covered an operational authorisation by article 11 of the NLD-MAR UAS, STS or PDRA the MIL-UAS are subject to certification.

GM4 Article 6 (3) UAS operations in the MIL-UAS-CERTIFIED cat

By derogation the MAA-NLD may allow operations involving weaponised UAS or carriage of dangerous goods in the MIL-UAS-SPECIFIC category.

The MAA-NLD may allow operations involving carriage of dangerous goods or weaponised UAS in the MIL-UAS-SPECIFIC category if;

- the operation is covered by a PDRA as set by MAA-NLD; or,
- at the request of the MIL UAS Operator with supporting risk assessment supplemented by mitigating measures to the MAA-NLD.

The risk mitigation measures in support of any application for the use of weaponised UAS transportation of dangerous goods by UAS should consider at least:

- (a) any undue exposure of people or other aircraft to hazards;
- (b) possible impacts to the airworthiness (DCAC) of the platform as a consequence of subsequent weapon release and/or separation;
- (c) hazards identified during launch/recovery and/or flight loads of the UAS/Weapon combination;
- (d) additional safety requirements e.g. with the use of any laser technology.

GM1 Article 7 (2c) (2d) Rules and procedures for the operation of MIL-UAS

In order to avoid time-consuming appraisals of repetitive individual approvals, the MAA-NLD applies "Standard Scenarios (STS)" or "Pre-Defined Risk Assessment (PDRA)" for a specific number of identified types of operations with known threats and acceptable risk mitigations. STS or PDRA limit the administrative burden for both MIL-UAS operator and the MAA-NLD by lowering the entry level for certain types of operation. STS and PDRA will be published on the MAA-NLD portal.

A STS or PDRA includes a declaration that shall be signed by the MIL-UAS operator's accountable manager (or equivalent) and submitted to the MAA-NLD. By submitting the

declaration, the operator indicates the covered operation will be conducted in accordance with the indicated general conditions and that all mitigation measures are in place and verified.

GM1 Article 8 (2) Rules and procedures for the competency of remote pilots

Remote pilots operating UAS in the 'MIL-UAS-SPECIFIC' training depend on the operation the operator is intending to conduct. As a basic requirement RPs must hold a full certificate in the category as set in Annex C/ SUBPART A, RP competency requirements in category MIL-UAS-OPEN. Depending on the intended operations, certain requirements are imposed on the remote pilot. Besides theoretical knowledge and practical experience, a remote pilot will have at least the following competencies:

- (a) ability to apply operational procedures (normal, contingency and emergency procedures, flight planning, pre-flight and post-flight inspections);
- (b) ability to manage aeronautical communication;
- (c) manage the unmanned aircraft flight path and automation;
- (d) leadership, teamwork and self-management;
- (e) problem solving and decision-making;
- (f) situational awareness;
- (g) workload management;
- (h) coordination or handover, as applicable.

GM2 Article 8 (4) Rules and procedures for the competency of remote pilots

For the purpose of this document, the term 'fit to operate' should be interpreted as physically and mentally fit to perform RPs duties and safely discharge their responsibilities. Depending on the intended operations, certain requirements for fitness of the remote pilot operating UAS in the 'MIL-UAS-SPECIFIC' category are defined in the STS or PDRA or as an additional requirement in the outcome of the SORA and will be included in the operational authorisation.

Remote pilots in all categories should not fly when they are unfit to perform their tasks due to injury, fatigue, medication, and sickness or 'other causes'. Nevertheless, there are no specific requirements or medical standards set out for operations in the MIL-UAS-OPEN category. As an guideline remote pilots should take into account the same considerations that they would if they participate in traffic.

GM3 Article 8 (5) Rules and procedures for the competency of remote pilots

Remote pilots in the MIL-UAS-CERTIFIED category must comply with the medical standards of the license that they hold. These military medical standards depend on the classification of the UAS, the intended use and the risk of the operation. Referring to the NLD-MAR-MRPL, NLD-MAR-FCL (3), STANAG 7126 and AAMedP-01.25 these standards will be set by the MAA-NLD and will be added to the existing pilot medical certification.

AMC1 Article 9 (1) Minimum age for remote pilots

Within the NLD-MOD, the minimum age to serve is set at 17. The minimum age for remote pilots does not apply for flying a UAS with a MC class 0 mark.

GM1 Article 10 Rules and procedures for airworthiness of UAS

The intent of article 10 is to redirect:

- (a) For the MIL-UAS-OPEN or MIL-UAS-SPECIFIC categories, to Annex B.
- (b) For the MIL-UAS-CERTIFIED category, to all other NLD-MARs applicable to airworthiness of aircraft. The NLD-MAR-UAS, except for providing the definition of the MIL-UAS-CERTIFIED category, does not apply further to the airworthiness aspects for the MIL-UAS-CERTIFIED category. The requirements of NLD-MAR-21, NLD-MAR-145, NLD-MAR-147 and NLD-MAR-66 are applicable to the MIL-UAS-CERTIFIED category as they are linked to the NLD-MAR-M.

Some aircraft are not required to hold any airworthiness approvals. When given approval by the MAA-NLD, these may be operated under an operational authorisation or permit to fly provided they are suitably separated from third parties and property, as well as other airspace users. A lack of 'demonstrable airworthiness' can still be accommodated, albeit with limitations or restrictions placed on the operation, where appropriate. This approach is intended to provide a reasonable and proportionate level of regulation.

At the highest level, aircraft have a Certificate of Airworthiness, which is underpinned by Type Certification, continued airworthiness processes, and design and production organisation approvals. UAS operated in the MIL-UAS-SPECIFIC category are not necessarily subject to specific certification requirements. Technical standards (including UAS designed for use in the MIL-UAS-OPEN category) are dependent on the proposed type of operation and its associated risk assessment.

GM1 Article 11 Rules for conducting an operational risk assessment

When applying to MAA-NLD for an operational authorisation, the MIL-UAS operator shall perform a risk assessment and submit it together with the application, including adequate mitigating measures.

The contents required by Article 11 of the NLD-MAR-UAS of the operational risk assessment is described in Annex D subpart A. The steps for operational risk assessment methodology required by Article 11 of the NLD-MAR-UAS are described in Annex D subpart B.

GM1 Article 12 (4) Authorizing operations in the 'MIL-UAS-SPECIFIC' category

The MAA-NLD shall specify whether the operational authorisation concerns the approval of a single operation or a number of operations specified in time or location(s) or both. The operational authorisation shall include the associated precise list of mitigating measures. The MIL-UAS operator is responsible that the intended operation complies with any applicable national rules relating to e.g. national legal acts implementing EU regulation 2016/679 (Algemene Verordening Gegevensbescherming (AVG)) or environmental rules.

GM2 Article 12 (4) Authorizing operations in the 'MIL-UAS-SPECIFIC' category

The MAA-NLD will issue an operational authorisation, if it considers that the operational risks are adequately mitigated. The MAA-NLD provides an online system for the submission of operational declarations, which provides the submitter with an automatic acknowledgement of receipt when the submission has been successful. If parts of the information still need to be added to complete the submission and/or the declaration is incomplete, the application will not be processed until the required information is provided. The MAA-NLD will authorize operations within reasonable time before the start of the MIL-UAS operation.

In order to facilitate cross-border operations, the acknowledgement of receipt shall be written in English. In order to facilitate national operations, the acknowledgement of receipt can be written in Dutch.

GM1 Article 13 Cross-border operations or outside the state of state of registration

Military aircraft always need a special permit to fly into a foreign airspace by the state, which has sovereignty over that airspace. For member states belonging to the North Atlantic Treaty Organisation (NATO), the "NAVO Binnenvlieg Regeling" applies. The NLD-MAR-UAS is not applicable for other Nation's military UAS operated by non-NLD MOD personnel.

Military remote pilots can operate in another NATO Member State with the permission of the MAA or CAA of that member state based on the same competency documents issued by the member state of registry. However, they must verify if specific legal regimes of that Member State are applicable and the prohibitions or access restrictions in some geographical zones. Other legal rules that are not directly related to aviation may also apply, namely regarding sovereignty, privacy, insurance and environmental.

If applicable, consult the website of the authority of the country of operation. Prior any deployment abroad, the MIL UAS Operator is responsible to contact the MAA or CAA of the Host Nation in order to determine what conditions are applicable for the use of foreign UAS and what documents need to be issued.

AMC1 Article 14 (1) Registration of MIL-UAS and MIL-UAS remote pilots

Military UAS within the 'MIL-UAS-OPEN' and 'MIL-UAS-SPECIFIC' category not subject to registration are:

- (a) dispensable UA in the MIL-UAS-OPEN or MIL-UAS SPECIFIC category intended to be used for one time only and/or with a specific purpose;
- (b) experimental UAS to be tested or part of a test;
- (c) MIL-UAS intended to be used for and part of a swarming operation.

AMC2 Article 14 (2) Registration of MIL-UAS and MIL-UAS remote pilots

Military UAS referring to AMC1 Article 14 or an exemption referring to Article 14 (2) should be provided with a unique nationality and registration mark according to Dutch air law (*Regulation' kenmerken, registratie en luchtwaardigheid militaire luchtvaartuigen 2022*). The MAA-NLD provides a registration number. The registration mark has to be placed according to this mentioned regulation.

AMC3 Article 14 (3) Registration of MIL-UAS and MIL-UAS remote pilots

Military UAS Remote Pilots operating in the category 'MIL-UAS-OPEN' and 'MIL-UAS-SPECIFIC' shall be registered by the MIL-UAS operator in a digital registration system with a unique and traceable number. The registration shall at least contains:

- (a) Name and registration number of the RP;
- (b) Qualification of the RP;
- (c) The validity of the qualification;
- (d) Name of issuing authority

The operator shall ensure that the digital registration system is available and accessible for the MAA-NLD.

AMC4 Article 14 (3) Registration of MIL-UAS and MIL-UAS remote pilots

When the MIL-UAS Operator has a need to deviate from this article, a request for exemption from the specific requirement shall be submitted to the MAA-NLD in accordance with NLD-MAR-11.

GM1 Article 14 (1) Registration of MIL-UAS and MIL-UAS Remote Pilots

Registration of an UAS, and its associated registration marking, is required to provide each UAS with a unique identity. To operate within NLD airspace military registration is required and registration markings must be displayed. Not having UA appropriately marked introduces a risk that accountability and assurance of Air Safety will be diluted or neglected entirely.

Within the NLD-MOD all MIL-UAS will be registered in the military aircraft register by the MAA-NLD. The MIL-UAS operator shall present the UAS to the responsible agency as mentioned in Annex B for assessment. A new acquired or self-built UAS with the intent to be used within the scope of the NLD-MAR-UAS or classified in accordance with Annex B should be presented to the responsible agency within the MoD. With a report the responsible agency announces the results of the assessment to the MAA-NLD after which inclusion in the military aircraft register takes place.

UAS marked with a CE class mark, in accordance with the European regulation 2019/945 still have to comply with the NLD-MAR-UAS and are subject to assessment by the Design Conformity Assessment Organisation.

Dispensable UA intended to be used only for one time and for a specific purpose according to AMC Article 14 (a) are for instance UAS to be used for target practice or as loitering munition. However; if an UA in this category can be used multiple times for training and will be transformed eventually from a target UA into loitering munition, the UA shall be subject to registration;

This article does not cover Test and Evaluation (T&E) activity. MIL-UAS applicants wishing to operate in a manner or configuration according to AMC Article 14 (b) must apply to the MAA-NLD for authorisation. Experimental UAS are only allowed in specific UAS experimental geographical zones e.g Artillery Shooting Range (ASK) and the associated conditions as set by the MAA-NLD.

UA exclusive to be used for and part of a swarming operation referring to AMC Article 14 (c) and are controlled collectively by one GCS do not have to be registered individually. Operators wishing to conduct a swarming operation must apply to the MAA-NLD for authorisation. These type of UAS are registered through separate arrangement in consultation with MAA-NLD. UA that can be used both individually and as part of swarming operations are subject to registration.

GM2 Article 14 (2) Registration of MIL-UAS and MIL-UAS Remote Pilots

The MAA-NLD will send a unique registration number and certificate of registration of the UAS to the. On request by the operator for operational reason, the MAA-NLD can provide an exemption.

GM1 Article 15 operational conditions for UAS geographical zones

Geographical zones are portions of airspace where UAS operations are facilitated, restricted or excluded. Depending on the duration of the validity of a UAS geographical zone, AIPs and NOTAMs can be used to inform manned aviation:

- a) UAS geographical zones in which UAS are exempted from one or more of the 'MIL-

- UAS-OPEN ' category requirements in accordance with Article 15(2) of the NLD-MAR-UAS;
- b) other UAS geographical zones which are of relevance for manned aviation

In order to fly the remote pilot has to determine the UAS category and plan the flight. It is the responsibility of the remote pilot to obtain updated information about any geographical zone(s) and comply with them before and during each flight.

AMC1 Article 16 Safety information

The MIL-UAS operator shall report any safety-related occurrence to the MAA-NLD with an MAA-NLD approved reporting system. Organisations without such a reporting system shall use a suitable MAA-NLD acceptable form as an alternative.

AMC2 Article 16 Safety information

The rules for notifications from the SG-005 and NLD-SMAR-1 are always beside each other so for that in some cases, an incident will be reported twice. The MIL-UAS operator shall adhere to the requirements defined in the NLD-SMAR-1.

NLD-SMAR-1 applies to:

- (1) MIL-UAS-CERTIFIED category;
 - (2) MIL-UAS-SPECIFIC category.
- Some OSOs require for low robustness that occurrence reporting procedures are included in the operational procedures.

For the MIL-UAS-OPEN category MAR.UAS.OPEN.050 is applicable.

ANNEX A: OPERATIONS IN THE 'MIL-UAS-OPEN' AND 'MIL-UAS-SPECIFIC' CATEGORIES

SUBPART A – Operations in the MIL-UAS-OPEN category

AMC1 MAR.UAS.OPEN.010 (1) General requirements

Operations in the MIL-UAS-OPEN category will be operated within (E-) VLOS conditions and can be performed with a RP with limited or no aviation experience. Designated responsibility can be assigned in the line of command of the RP. The unit commander of the RP or equivalent manager (in the line of command) shall be ultimately accountable and is therefore the responsible officer/manager for the UAS operation. As a rule, this is the hierarchical direct commander or his/her authorised representative.

AMC2 MAR.UAS.OPEN.010 (2) General requirements

All Remote Pilots shall:

- a) be familiar with all publications and orders required to safely operate the UAS; and,
- b) maintain a level of competence appropriate to the tasks being conducted; and,
- c) be familiar with manufacturer's instructions of the UAS;
- d) only operate one UAS at the time;
- e) have completed an online training course followed by completing successfully an online theoretical knowledge examination refer Annex C.

AMC3 MAR.UAS.OPEN.020 (3) UAS operations with MC-0

MIL-UAS operations with MC-0 shall be conducted in such a way that a remote pilot of the unmanned aircraft does not overfly assemblies of people and reasonably expects that no uninvolved person will be overflowed. In the event of unexpected overflight of uninvolved persons, the remote pilot shall reduce as much as possible the time during which the unmanned aircraft overflies those persons.

AMC4 MAR.UAS.OPEN.010 (5) General requirements

Where the UAS operation involves the flight of the unmanned aircraft starting from a natural elevation in the terrain or over terrain with natural elevations, the unmanned aircraft shall be maintained within 120 metres from the closest point of the surface of the earth. The measurement of distances shall be adapted accordingly to the geographical characteristics of the terrain, such as plains, hills, mountains.

Except for military operational conditions, the entity responsible for the artificial obstacle referred to in MIL.UAS.OPEN.010 (5) needs to grant the remote pilot permission to conduct an operation close to a tall man-made obstacle, e.g. a building or antenna.

AMC5 MAR.UAS.OPEN.010 (8) General requirements

By way of derogation from item (8) of Article MAR.UAS.OPEN.010, UAS operations with MC-1 or MC-2 can be conducted, when the follow-me mode is active, up to a distance of 50 metres from the remote pilot. If the unmanned aircraft is used in E-VLOS mode the assistance of an unmanned aircraft observer is mandatory.

AMC6 MAR.UAS.OPEN.010 (9) General requirements

Flying over military terrain includes military barracks but is only allowed with the permission of the permit holder/ owner of the overflown complex. MIL UAS in the category MIL-UAS-OPEN are only allowed in uncontrolled airspace (class G) and are prohibited to fly over/near:

- Control zones around controlled aerodromes (CTR);
- uncontrolled aerodromes within a radius of 1200m;
- helicopter platforms and landing zones within a radius of 1200m;
- government buildings within a radius of 150m;
- palaces and buildings of the royal house within a radius of 500m;
- events or other temporarily cordoned off areas;
- assemblies of uninvolved persons;
- specific protected nature areas or protected nature reserves
- roads with a speed limit above 80km/h;
- railway lines and/or high-voltage power lines;
- drinking water areas;
- large seaports;
- industries handling hazardous substances;
- secure sites within a radius of 500m.

For MIL-UAS-OPEN it is prohibited to operate a flight higher than 30 metres above the nearest point on the earth's surface in an active low-flying zone or routes for civil or military aircraft.

GM1 MAR.UAS.OPEN.010 (2) General requirements

Although not mandatory for the MIL-UAS-OPEN category Remote pilots should maintain an auditable record of UAS training and flying activity to demonstrate their experience in case this is requested in the MIL-UAS specific category.

GM2 MAR.UAS.OPEN.010 (3) General requirements

Operations with MC-3 class UAS addresses operations during which flying close to people is intended for a significant portion of the flight. The minimum distance ranges from 30 m to 5 m from uninvolved people. 5 m is only allowed when there is an active low-speed mode function on the UA, and the remote pilot has conducted an evaluation of the situation regarding the weather, the performance of the UA and the segregation of the overflown area.

Table A.01 overview limitations in MC-class

MC class (MTOM)	Limitations
MC-0 (250 g)	• not over assemblies of people.
MC-2 (4 kg)	• not over assemblies of people and not over uninvolved people; • 30 m from uninvolved people (or 5 m with active low speed mode; • operated with geo-awareness function.
MC-3 (25 kg)	• same as MC-2, and • at least 150 m from residential, commercial, industrial or recreational areas.

GM3 MAR.UAS.OPEN.010 (9) General requirements

A detailed list of prohibited locations is provided in the “Regeling zonering onbemande luchtvaartuigen” and the Aeronautical Information Publication Netherlands. RPs can also find critical information about the airspace in a NOTAM.

GM1 MAR.UAS.OPEN.020 UAS operations with MC-0

For UAS with class MC-3, before starting the UAS operation, the remote pilot should assess the area and should reasonably expect that no uninvolved person will be overflown. This evaluation should be made taking into account the configuration of the site of operation (e.g. the existence of roads, streets, pedestrian or bicycle paths), and the possibility to secure the site and the time of the day. In case of an unexpected overflight, the remote pilot should reduce as much as possible the duration of the overflight, for example, by flying the UA in such a way that the distance between the UA and the uninvolved people increases, or by positioning the UAS over a place where there are no uninvolved people.

AMC1 MAR.UAS.OPEN.030 UAS operations with MC-3

UAS operations with MC-3 shall comply with all of the following conditions:

- (a) be conducted in such a way that the unmanned aircraft does not overfly uninvolved persons and the UAS operations take place at a safe horizontal distance of at least 30 meters from them;
- (b) the remote pilot may reduce the horizontal safety distance down to a minimum of 5 meters from an uninvolved person when operating an unmanned aircraft with an active low speed mode function and after evaluation of the situation regarding;
 - i) weather conditions;
 - ii) performance of the unmanned aircraft;
 - iii) segregation of the overflown area.
- (c) the UA registered as class MC-3, complies with the requirements of that class as defined in the Annex B of NLD-MAR-UAS, and is operated with a geo-awareness function.
- (d) be performed by a remote pilot who is familiar with manufacturer’s instructions of the UAS and holds a certificate of remote pilot competency as set out Annex C: remote pilot competencies /SUBPART A – RP competency requirements in category MIL-UAS-OPEN;
- (e) be performed by a remote pilot who has completed an online training course and passed the online theoretical knowledge examination as referred to MAR.UAS.C.A.010 Theoretical competencies;
- (f) be performed by a remote pilot who has completed a self-practical training in the operating conditions as set out in MAR.UAS.C.A.020 practical competencies;
- (g) be performed by a remote pilot who has declared the completion of the self-practical training defined in MAR.UAS.C.A.040 Proof of completion.

GM1 MAR.UAS.OPEN.050 (6) Responsibilities of the responsible officer/manager

The intranet site of the MAA-NLD provides a tool for reporting occurrences by the responsible officer/manager in the MIL-UAS-OPEN category. This requirement does not replace the requirements of the standard reporting system for incidents and/or occurrences within the MOD. Occurrences can to be reported in both systems.

GM1 MAR.UAS.OPEN.060 (2a) Responsibilities of the Mil Remote pilot

A psychoactive substance is understood to mean a substance or a combination of substances the use of which is known or should reasonably be expected to impair the ability to perform the intended activities. Specifically, for medicines, after the use of medicines and/or other substances that can reduce the fitness for the performance of the function (as stated on the package leaflet), users are prohibited from executing their duty. This also applies to over-the-counter medicines and homeopathic remedies.

GM2 MAR.UAS.OPEN.060 (2e) Responsibilities of the Mil Remote pilot

In order to make efficient use of the radio spectrum and avoid harmful interference the RP also has to ensure that the frequency for the UAS is available.

GM3 MAR.UAS.OPEN.060 (2g) Responsibilities of the Mil Remote pilot

If necessary for the mission MIL-UAS are exempted from using lights on military aircraft. Therefore, MIL-UAS may not be obligated to have at least one green flashing light for the purpose of visibility of the unmanned aircraft at night..

GM4 MAR.UAS.OPEN.060 (2h) Responsibilities of the Mil Remote pilot

UA fitted with video cameras often provide an opportunity to downlink live video to the remote pilot either via a mobile phone, tablet, computer, screen, or video goggles. This capability provides the pilot with a pseudo pilot's eye view from the drone and is known as First Person View (FPV). An unmanned aircraft observer can be used when the remote pilot conducts UAS operations in first-person view (FPV), which is a method used to control the UA with the aid of a visual system connected to the camera of the UA. In all cases, the remote pilot is still responsible for the safety of the flight. FPV can make it difficult for the remote pilot to accurately judge speed and distance in order to effectively see and avoid obstacles and other aircraft. The use of FPV equipment is not an acceptable mitigation for BVLOS flights unless the relevant operator has received a specific authorisation to do so from the MAA-NLD.

The NLD-MAR-UAS allows to fly without keeping direct visual contact with the UA, provided the RP has a unmanned aircraft observer next to him/her keeping direct visual contact with the UA, scanning the airspace to make sure that the RP does not endanger other parties (e.g. aircraft or buildings or persons). The unmanned aircraft observer must be located alongside the RP so they can immediately communicate with each other.

SUBPART B – Operations in the MIL-UAS-SPECIFIC category

AMC1 MAR.UAS.SPEC.020 (1) Operational declaration

The UAS operator should submit an application for an operational authorisation according to the template as published by the MAA-NLD.

AMC1 MAR.UAS.SPEC.040 Issuance of an operational authorisation

The MAA-NLD will grant an operational authorisation according to the format as published by the MAA-NLD.

AMC1 MAR.UAS.SPEC.050 Responsibilities of the MIL-UAS operator

The MIL-UAS operator should develop procedures as required by the standard scenario (STS) or by the operational authorisation. Where the MIL-UAS operator is required to develop an OM in accordance with MAR.UAS.SPEC.030 (3) (e), the procedures should be included in that manual.

GM1 MAR.UAS.SPEC.050 Responsibilities of the MIL-UAS operator

The MIL-UAS operator is accountable that operations comply with other the national and international laws and regulations. The MIL-UAS operator shall, besides the NLD-MAR-UAS, adhere to other legislation, such as national legal acts implementing EU Regulation 2016/679 (Algemene Verordening Gegevensbescherming (AVG)) and environmental legislation (e.g. Natura 2000).

AMC1 MAR.UAS.SPEC.100 Use of certified equipment and certified UAS

For the purposes of MIL-UAS.SPEC.100, 'certified equipment' is considered any equipment for which the relevant design organisation has demonstrated compliance with the applicable certification specifications. The use of certified equipment or certified MIL-UAS in the 'MIL-UAS-SPECIFIC' category of operation does not imply a transfer of the flight activities into the 'MIL-UAS-CERTIFIED' category of operation. The use of certified equipment or certified UAS in the 'MIL-UAS-SPECIFIC' category should be considered as a risk reduction and/or mitigation measure in the SORA.

ANNEX B: RULES AND PROCEDURES FOR THE AIRWORTHINESS OF MIL-UAS

SUBPART A – Initial and continued airworthiness

GM1 MAR.UAS.B.A.010 Design certificates overview

Table B.01 overview of the required certificates

Category of operation	SAIL	Required design certificate	Remark(s)
MIL-UAS-OPEN		Design Conformity Assessment Certificate (DCAC)	DCAC identifies type class.
MIL-UAS-SPECIFIC	I/II/III		DCAC identifies SAIL.
	IV		DCAC identifies SAIL. Design verification by the MAA-NLD required.
	V/VI	Military (Restricted) Type Certificate (M(R)TC)	Refer to NLD-MAR-21.
MIL-UAS-CERTIFIED			

GM2 MAR.UAS.B.A.010 Concept development

Concept development is a special kind of operation in the MIL-UAS-SPECIFIC category that, when no dedicated Standard Scenario is available, requires the concept development MIL-UAS operator to obtain an operational authorisation based on a SORA.

Compliance with the design related OSOs and (when applicable) the mitigation measures M1(A).2 and M2.1, which is normally covered by using a MIL-UAS type having a DCAC, must now be demonstrated by the concept development MIL-UAS operator.

For this, Subpart C of Annex B applies.

GM1 MAR.UAS.B.A.020 Issue of DCAC

DCAC shall primarily be issued by an approved Design Conformity Assessment Organisation.

The option of DCAC issued by the MAA-NLD serves as a fall back in case the approval of the Design Conformity Assessment Organisation has become invalid for whatever reason.

GM1 MAR.UAS.B.A.030 Format of DCAC

The format, layout, full content and version control of the DCAC itself shall be defined by the Design Conformity Assessment Organisation and be included in the organisation exposition (required per MAR.UAS.B.D.060).

AMC1 MAR.UAS.B.A.040 Design verification process

A memorandum requesting design verification using the formal correspondence system of the Ministry of Defence is acceptable.

All relevant documents shall be attached to the 'Nota' or provided separately, in which case the 'Nota' shall contain a full reference of the documents and a link to their location (e.g. SharePoint work space), which is made accessible for the MAA-NLD.

The procedure for design verification shall be included in the organisation exposition (required per MAR.UAS.B.D.060).

AMC2 MAR.UAS.B.A.040 Using a EASA design verification report

If the design of a MIL-UAS has been verified by EASA and EASA has issued a Design Verification Report (DVR), the design verification by the MAA-NLD is still required.

In this case, the EASA DVR is acceptable as evidence to show compliance with the design related OSOs.

However, it must be made clear that the type configuration to which the EASA DVR applies is the same as the MIL-UAS for which the design verification is requested and the DCAC is intended.

In case differences in configuration exist and the DVR is still used as evidence, it must be made clear to which elements (OSOs) and to what extent the DVR applies. For the elements (OSOs) to which the DVR does not (fully) apply, the Design Conformity Assessment Organisation shall demonstrate compliance.

AMC3 MAR.UAS.B.A.040 Design verification basis

In the absence of a standard to be used as the design verification basis published by the MAA-NLD, standards published by other (military) aviation authorities intended for this purpose may be used. For example: special conditions (SC) and certification specifications (CS) by EASA.

Globally recognised military or industrial standards may also be used. For example: MIL-STD, NATO STANAGs (and associated allied publications), EN or ISO.

The same applies to the acceptable means of compliance.

The standard(s) and means of compliance to be used in a design verification project for a MIL-UAS type shall be agreed with the MAA-NLD at the start of such project. The procedure for reaching this agreement shall be included in the organisation exposition (required per MAR.UAS.B.D.060).

SUBPART B – Technical requirements for military UAS operated in the MIL-UAS-OPEN category

AMC1 MAR.UAS.B.B.010 HDBV-014 legacy

MIL-UAS that have been assessed by COMMIT under HDBV-014 prior to the release of this NLD-MAR-UAS may be assigned to a military type class based on UA mass and may receive a DCAC without performing a new conformity assessment.

AMC1 MAR.UAS.B.B.020 Tether tensile length

In the case of a tethered UA, the tensile length of the tether should be less than 100 m.

AMC2 MAR.UAS.B.B.020 Lights

MIL-UAS do not need to be equipped with lights for the purpose of controllability of the UA.

However, lights may be used for the purpose of increased visibility of the UA (for VLOS) at night.

Acceptable is at least one green flashing light.

For operational purposes, the light may be turned off (reference "Regeling doven luchtvaartuiglichten militaire luchtvaartuigen").

GM1 MAR.UAS.B.B.020 Direct remote identification

A direct remote identification as an opt-in. Each UA intended to be operated in the 'MIL-UAS-OPEN' or 'MIL-UAS-SPECIFIC' category may be equipped with a remote identification system. Civil UA shall have a remote ID that allows data upload in accordance with Implementing Regulation (EU) 2019/947.

MIL-UAS operators intending to perform these tasks on behalf of the MoD are performing State Operations. They fly under military legislation. Unless for one or more services or activities these civil (EU) articles can apply, for e.g. a non-operational flight within a Civil CTR. It can then be a requisite that a remote ID is present.

If equipped and functional, a direct remote identification add-on shall comply with the following

1. Electronic ID (Real-time broadcast - open cat);
2. This transmitter will continuously broadcast a signal with the following data:
 - a. Operator registration number
 - b. Serial number of the aircraft
 - c. Position and altitude of the aircraft in relation to the ground (AGL)
 - d. Direction and speed over the ground
 - e. Position of the pilot or position of take-off.

GM1 MAR.UAS.B.B.030.(b) Maximum speed

The maximum speed of the UA shall be expressed:

- (a) for hover-capable UA, as ground speed in horizontal flight in all directions;
- (b) otherwise, as airspeed in horizontal straight and level flight.

GM1 MAR.UAS.B.B.050.(c) Low-speed mode

A low-speed mode function is not required in general, but only to allow a reduced horizontal safety distance i.a.w. MAR.UAS.OPEN.030. (3).

SUBPART C – Technical requirements for MIL-UAS types operated in the MIL-UAS-SPECIFIC category

GM1 MAR.UAS.B.C.010 Introduction to robustness

- (a) To properly understand the SORA process, it is important to introduce the key

concept of robustness. Any given risk mitigation or operational safety objective (OSO) can be demonstrated at different levels of robustness. The SORA process uses three different levels of robustness: low, medium and high, commensurate with the risk.

- (b) The robustness designation is achieved using both the level of integrity (i.e. safety gain) provided by each mitigation, and the level of assurance (i.e. method of proof) that the claimed safety gain has been achieved. These are both risk-based.
- (c) General guidance for the level of assurance is provided below:
 - (i) A low level of assurance is where the applicant simply declares that the required level of integrity has been achieved.
 - (ii) A medium level of assurance is where the applicant provides supporting evidence that the required level of integrity has been achieved. This is typically achieved by means of testing (e.g. for technical mitigations) or by proof of experience (e.g. for human-related mitigations).
 - (iii) A high level of assurance is where the achieved integrity has been found to be acceptable by the MAA-NLD.
- (d) The specific criteria defined in MAR.UAS.B.C.010 take precedence over the general criteria defined in paragraph (c) above.
- (e) The table below provides guidance to determine the level of robustness based on the level of integrity and the level of assurance:

Table B.02 guidance for the level of robustness

	Low assurance	Medium assurance	High assurance
Low integrity	Low robustness	Low robustness	Low robustness
Medium integrity	Low robustness	Medium robustness	Medium robustness
High integrity	Low robustness	Medium robustness	High robustness

For example, if an applicant demonstrates a medium level of integrity with a low level of assurance, the overall robustness will be considered low. In other words, the robustness will always be equal to the lowest level of either the integrity or the assurance.

GM1 MAR.UAS.B.C.020 Guidance on design related OSOs

Table B.03 guidance on OSOs.

OSO	Guidance
05	This OSO complements: (1) the safety requirements for containment defined in the main body; and (2) OSO #10 and OSO #12, which only address the risk of a fatality while operating over populated areas or assemblies of people. Definitions for the severity of failure conditions may be taken from JARUS AMC RPAS.1309 Issue 2.
06	For the purpose of the SORA and this specific OSO, the term 'C3 link' encompasses: (1) the C2 link; and (2) any communication link required for the safety of the flight.

OSO	Guidance
	To correctly assess the integrity of this OSO, the applicant should identify the following: (1) The performance requirements for the C3 links necessary for the intended operation. (2) All the C3 links, together with their actual performance and RF spectrum usage. Note: the UAS designer in the UAS manual typically documents the specification of the performance and RF spectrum for a C2 Link. Note: The main parameters associated with the performance of a C2 link (RLP) and the performance parameters for other communication links (e.g. RCP for communication with ATC) include, but are not limited to, the following: i) the transaction expiration time; ii) the availability; iii) the continuity; and iv) the integrity. Refer to the ICAO references for definitions. (3) The RF spectrum usage requirements for the intended operation (including the need for authorisation if required). Note: Usually, countries publish the allocation of RF spectrum bands applicable in their territories. This allocation stems mostly from the International Communication Union (ITU) Radio Regulations. However, the applicant should check the local requirements and request authorisation when needed since there may be national differences and specific allocations (e.g. national sub-divisions of ITU allocations). Some aeronautical bands (e.g. AM(R) S, AMS(R) S 5030-5091MHz) were allocated for potential use in UAS operations under the ICAO scope for UAS operations classified as cat. C ('certified'), but their use may be authorised for operations under the 'specific' category. It is expected that the use of other licensed bands (e.g. those allocated to mobile networks) may also be authorised under the 'specific' category. Some unlicensed bands (e.g. industrial, scientific and medical (ISM) or short-range devices (SRDs)) may also be acceptable under the 'specific' category; for instance, for operations with lower integrity requirements. (4) Environmental conditions that might affect the performance of C3 links.
10 12	The objectives of OSO#10 and OSO#12 are to complement the technical containment safety requirements by addressing the risk of a fatality while operating over populated areas or assemblies of people. In the scope of this assessment, external systems supporting UAS operations are defined as systems that are not already part of the UAS but are used to: (1) launch/take off the UA; (2) make pre-flight checks; or (3) keep the UA within its operational volume (e.g. GNSS, satellite systems, air traffic management, U-space).

OSO	Guidance
	External systems activated/used after a loss of control of the operation are excluded from this definition.
18	Each UA is designed with a flight envelope that describes its safe performance limits with regard to minimum and maximum operating speeds, and its operating structural strength. Automatic protection of the flight envelope is intended to prevent the remote pilot from operating the UA outside its flight envelope. If the applicant demonstrates that the remote-pilot is not in the loop, this OSO is not applicable. A UAS implementing such an automatic protection function will ensure that the UA is operated within an acceptable flight envelope margin even in the case of incorrect remote-pilot control inputs (human errors). UAS without automatic protection functions are susceptible to incorrect remote-pilot control inputs (human errors), which can result in the loss of the UA if the designed performance limits of the aircraft are exceeded. Failures or development errors of the flight envelope protection are addressed in OSOs #5, #10 and #12.
19.3	This OSO covers UAS design, i.e. systems detecting and/or recovering from human errors (e.g. safety pins, use of acknowledgment features, fuel or energy consumption monitoring functions ...)
24	To assess the integrity of this OSO, the applicant determines: - whether credit can be taken for the equipment environmental qualification tests / declarations, e.g. by answering the following questions: - Is there a Declaration of Design and Performance (DDP) available to the applicant stating the environmental qualification levels to which the equipment was tested? - Did the environmental qualification tests follow a standard considered adequate by the competent authority (e.g. DO-160)? - Are the environmental qualification tests appropriate and sufficient to cover all the environmental conditions related to the ConOps? - If the tests were not performed following a recognised standard, were the tests performed by an organisation/entity that is qualified or that has experience in performing DO-160 like tests? - Can the suitability of the equipment for the intended/expected UAS environmental conditions be determined from either in-service experience or relevant test results? - Any limitations, which would affect the suitability of the equipment for the intended/expected UAS environmental conditions. The lowest integrity level should be considered for those cases where a UAS equipment has only a partial environmental qualification and/or a partial demonstration by similarity and/or parts with no qualification at all.

GM1 MAR.UAS.B.C.030 Mitigation measure M2.1 'reduced effects of UA impact dynamics'

M2 mitigations are intended to reduce the effect of ground impact once the control of the operation is lost. This is done by reducing the effect of the UA impact dynamics (i.e. the

area, energy, impulse, transfer energy, etc.). One example would be the use of a parachute.

The use of industry standards, such as prEN 4709-001, ASTM F3389/F3389M-21 and F3322-18, is encouraged when developing mitigations used to reduce the effect of ground impact.

AMC1 MAR.UAS.B.C.040 Ground risk buffer containment

The level of integrity for medium and high robustness of this criterion requires: no single failure of the UAS or any external system supporting the operation shall lead to operation outside of the ground risk.

Example methods of achieving this may include:

- an independent Flight Termination Systems (FTS), that will initiate the end of the flight, when exiting the operational volume; or
- a secondary independent emergency flight control system, that ends the flight in a controlled manner; or
- a tether that prevents the drone from exiting the ground risk buffer;
- a fail-safe health monitoring system that triggers in the event of a critical feature failure (such as navigation).

SUBPART D – Design Conformity Assessment Organisation approval

AMC1 MAR.UAS.B.D.020 Eligibility

The department COMMIT/DWS&B/LVS/FWA/UAS is marked as the responsible organisation.

AMC1 MAR.UAS.B.D.120.(d) Determination of unsafe conditions

MIL-UAS manufacturers are not obliged by standard to provide information to enable the DCAO to determine if an unsafe condition exists in a MIL-UAS type. Only by contract the provision of information by the MIL-UAS manufacturer can be assured. Regardless manufacturer support, the DCAO can derive unsafe conditions from analyses of occurrences reported within the NLD-MAS.

For compliance with this paragraph, it is acceptable that the DCAO determines the existence of unsafe conditions:

- (a) For all MIL-UAS types*: from analyses of occurrences reported within the NLD-MAS, and
- (b) For MIL-UAS types to be operated in the MIL-UAS-SPECIFIC category in SAIL II, III or IV: from information provided by the manufacturer, for which a contract should be in place if provision of such information is not inherent to the manufacturer process.

* Note: for MIL-UAS types to be operated in the MIL-UAS-SPECIFIC category in SAIL V or VI or in the MIL-UAS-CERTIFIED category, an MTC is required and the requirements regarding Airworthiness Directives is covered by the obligations of the MTC holder i.a.w. NLD-MAR 21.

SUBPART E – Continuing airworthiness

AMC1 MAR.UAS.B.E.030 Repairs

The following methods should be used to prevent the to be discarded MIL-UAS, or components thereof, re-entering the supply system:

- (a) permanently marking or stamping the MIL-UAS or component, as "NOT SERVICEABLE." (ink stamping is not an acceptable method);
- (b) removing original part number or data plate identification;
- (c) maintaining a tracking or accountability system, by serial number or other individualised data, to record transferred unsalvageable MIL-UAS or component;
- (d) including written procedures concerning disposal of to be discarded MIL-UAS or components.

ANNEX C: REMOTE PILOT COMPETENCIES

SUBPART A – Competency requirements in category MIL-UAS-OPEN

AMC1 MAR.UAS.C.A.010 (b) Theoretical competencies

For operations in the MIL-UAS Open theoretical knowledge is required.

Subjects for the basic theoretical knowledge training courses should cover at least the following:

1. Air safety:
 - (a) non-reckless behaviour, safety precautions for UAS operations and basic requirements regarding dangerous goods;
 - (b) starting or stopping the operations taking into account environmental factors, UAS conditions and limitations, remote pilot limitations and human factors.
2. Operation in VLOS and EVLOS, which entails:
 - (a) keeping a safe distance from people, animals, property, vehicles, and other airspace users;
 - (b) the identification of assemblies of people;
 - (c) a procedure in case the UAS encounters other traffic;
 - (d) respecting the height limitation;
 - (e) when using a UA observer, the responsibilities and communication between the UA observer and the remote pilot;
 - (f) familiarisation with the operating environment, in particular:
 - (g) how to perform the evaluations of the presence of uninvolved person in the overflowed area as required;
 - (h) informing the people involved.
3. Airspace restrictions:
 - (a) obtain and observe updated information about any flight restrictions or conditions according to Article 15 of the NLD-MAR-UAS;
 - (b) describe the types of geographical zones and the procedures for receiving a flight authorisation;
 - (c) upload the geographical zones onto the geo-awareness system.
4. Aviation regulations:
 - (a) Introduction to air law and the Netherlands military aviation system;
 - (b) NLD-MAR-UAS and its applicability;
 - (c) subcategories in the 'MIL-UAS-OPEN' category and the associated classes of UAS;
 - (d) registration of RP;
 - (e) the responsibilities of the MIL-UAS operator;
 - (f) the responsibilities of the remote pilot;
 - (g) occurrence and hazard reporting.
5. Human performance limitations:
 - (a) the influence of psychoactive substances or alcohol or when the remote pilot is unfit to perform his/her tasks due to injury, fatigue, medication, sickness or other causes;
 - (b) human perception.
6. Factors influencing VLOS;
 - (a) the distance of obstacles and the distance between the UA and obstacles;
 - (b) evaluation of the speed of the UA;
 - (c) evaluation of the height of the UA;
 - (d) situational awareness.
7. Operational procedures;
 - (a) pre-flight:

- i) assessment of the area of operation and the surrounding area, including the terrain and potential obstacles and obstructions for keeping (E-)VLOS of the UA, potential overflight above uninvolved persons, and the potential overflight above critical infrastructure;
 - ii) identification of a safe area where the remote pilot can perform a practice flight;
 - iii) environmental and weather conditions (e.g. factors that can affect the performance of the UAS such as electromagnetic interference, wind, temperature, etc.); methods of obtaining weather forecasts; and
 - iv) checking the condition of the UAS.
- (b) In-flight normal procedures;
 - i) determine the UA's attitude, altitude, and direction of flight;
 - ii) observe the airspace for other air traffic or hazards;
 - iii) determine that the UA does not pose a danger for the life or property of other people;
 - iv) contingency and emergency procedures for abnormal situations;
 - v) managing the UAS flight path in abnormal situations;
 - vi) managing the situation when the UAS positioning equipment is impaired;
 - vii) managing the situation of incursion of a person into the area of operation, and taking appropriate measures to maintain safety;
 - viii) managing the exit from the area of operation as defined during the flight preparation;
 - ix) managing the situation when a manned aircraft flies near the area of operation;
 - x) managing the incursion of another UAS into the area of operation;
 - xi) dealing with a situation of a loss of attitude or position control caused by external phenomena; and
 - xii) following the C2 loss-of-link procedure.
- (c) Post-flight:
 - i) maintenance;
 - ii) logging of flight details.
- 8. UAS general knowledge:
 - (a) basic principles of flight;
 - (b) the effect of environmental conditions on the performance of the UAS;
 - (c) principles of command and control;
 - (d) overview of (data link) frequencies and spectrums;
 - (e) automatic flight modes, override and manual intervention;
 - (f) familiarisation with the instructions provided by the user's manual of a UAS, and in particular with regard to:
 - i) overview of the main elements of the UAS;
 - ii) limitations (e.g. mass, speed, environmental, duration of battery, etc.);
 - iii) controlling the UAS in all phases of flights (e.g. the take-off, hovering in mid-air, when applicable, flying basic patterns and landing);
 - iv) features that affect the safety of flight;
 - v) setting the parameters of the lost link procedures;
 - vi) setting the maximum height;
 - vii) procedures to load geographical zone data into the geo-awareness system.
- 9. Safety considerations:
 - (a) instructions to secure the payload;
 - (b) precautions to avoid injuries from rotors and sharp edges; and
 - (c) the safe handling of batteries.
- 10. Maintenance instructions.
- 11. Privacy and data protection;
 - (a) understanding the risk posed to privacy and data protection;

- (b) the guiding principles for data protection under the national legal acts implementing EU Regulation 2016/679 (Algemene Verordening Gegevensbescherming (AVG)).
- 12. Security:
 - (a) an understanding of the security risk;
 - (b) an overview of the NLD MOD regulations;
- 13. Meteorology:
 - (a) the effect of weather on the performance of the UAS:
 - i) wind (e.g. urban effects, turbulence);
 - ii) temperature;
 - iii) visibility;
 - iv) density of the air;
 - v) obtaining and interpretation of weather forecasts;
- 14. UAS flight performance:
 - (a) the typical operational envelope of a rotorcraft, for fixed wing and hybrid configurations;
 - (b) mass and balance, and center of gravity (CG);
 - (c) consider the overall balance when attaching gimbals, payloads;
 - (d) understand that payloads can have different characteristics, thus making a difference to the stability of a flight;
 - (e) understand that each different type of UA has a different CG;
 - (f) secure the payload.
- 15. Batteries:
 - (a) understand the power source to help prevent potential unsafe conditions;
 - (b) familiarise with the existing different kinds of battery types;
 - (c) understand the terminology used for batteries;
 - (d) understand how a battery functions (e.g. charging, usage, danger, storage).
- 16. Technical and operational mitigations for ground risk:
 - (a) low-speed mode functions;
 - (b) evaluating the distance from people;
 - (c) the 1:1 rule.

GM1 MAR.UAS.C.A.010 (b) Theoretical competencies

By passing the additional theoretical knowledge examination, the RP should demonstrate that he/she;

1. understands the safety risks linked with a UAS operation in close proximity to uninvolved people;
2. has basic knowledge on how to plan a flight and define contingency procedures;
3. understands how weather conditions may affect the performance of the UAS.

AMC1 MAR.UAS.C.A.020 Practical competencies

The aim of the practical self-training is to ensure that the (future) remote pilot demonstrates at all times the ability to:

1. operate a class MC-3 UAS within its limitations;
2. complete all manoeuvres with smoothness and accuracy;
3. exercise good judgment and airmanship;
4. apply theoretical knowledge;
5. maintain control of the UA at all times in such a manner that the successful outcome of a procedure or manoeuvres is never seriously in doubt;

The remote pilot should complete the practical-skills self-training with a UAS that features the same flight characteristics (e.g. fixed wing, rotorcraft), control scheme (manual or automated, human-machine interface) and a similar weight as the UAS intended for use in the UAS operation;

If a UAS with both manual and automated control schemes is used, the practical-skills self-training should be done with both control schemes. If a UAS has multiple automated features, the remote pilot should demonstrate proficiency with each automated feature;

The practical-skills self-training should contain at least flying exercises regarding take-off or launch and landing or recovery, precision flight maneuvers remaining in a given airspace volume, hovering in all orientations or loitering around positions when applicable.

In addition, the remote pilot should follow the contingency procedures for abnormal situations (e.g. a return-to-home function, if available), as stipulated in the user's manual provided by the manufacturer. However, the remote pilot should only follow those contingency procedures that do not require the deactivation of the UAS functions that may reduce its safety level.

GM1 MAR.UAS.C.A.020 Practical competencies

Practical competencies for the practical-skills self-training

When doing the practical-skills self-training, the remote pilot should perform as many flights as necessary to gain a reasonable level of knowledge and the skills to operate the UAS. The following list of practical competencies are recommended;

- 1) Preparation of the UAS operation:
 - a) chosen payload is compatible with the UAS used for the UAS operation;
 - b) zone of UAS operation is suitable for the intended operation;
 - c) UAS meets the technical requirements of the geographical zone;
- 2) define the area of operation in which the intended operation takes place in accordance with MIL.UAS.OPEN.040;
- 3) define the area of operation considering the characteristics of the UAS;
- 4) identify the limitations published by the MS for the geographical zone (e.g. no-fly zones, restricted zones and zones with specific conditions near the operation zone), and if needed, seek authorisation by the entity responsible for such zones;
- 5) identify the goals of the UAS operations;
- 6) identify any obstacles and the potential presence of uninvolved persons in the area of operation that could hinder the intended UAS operation;
- 7) check the current meteorological conditions and the forecast for the time planned for the operation.
- 8) Preparation for the flight:
 - a) assess the general condition of the UAS and ensure that the configuration of the UAS complies with the instructions provided by the manufacturer in the user's manual;
 - b) ensure that all removable components of the UA are properly secured;
 - c) make sure that the software installed on the UAS and on the Ground Control Station is the latest published by the UAS manufacturer;
 - d) calibrate the instruments on board the UA, if needed;
 - e) identify possible conditions that may jeopardize the intended UAS operation;
 - f) check the status of the battery and make sure it is compatible with the intended UAS operation;
 - g) activate the geo-awareness system and ensure that the geographical information is up to date;
 - h) set the height limitation system, if needed;

- i) set the low-speed mode, if available; and
 - j) check the correct functioning of the C2 link.
- 9) Flight under normal conditions:
- a) following the procedures provided by the manufacturer in the user's manual,
 - b) take off (or launch);
 - c) make a stable flight:
 - i) hover in case of multirotor UA;
 - ii) perform coordinated large turns;
 - iii) perform coordinated tight turns;
 - iv) perform straight flight at constant altitude;
 - v) change direction, height and speed;
 - vi) follow a path;
 - vii) return of the UA towards the remote pilot after the UA has been placed at a distance that no longer allows its orientation to be distinguished, in case of multirotor UA;
 - viii) perform horizontal flight at different speeds (critical high speed or critical low speed), in case of fixed-wing UA;
 - d) keep the UA outside no-fly zones or restricted zones, unless holding an authorisation;
 - e) use some external references to assess the distance and height of the UA;
 - f) perform a return-to-home (RTH) procedure — automatic or manual;
 - g) land (or recover);
 - h) perform a landing procedure and a missed approach in case of fixed-wing UA; and
 - i) perform real-time monitoring of the status and endurance limitations of the UAS;
 - j) maintain sufficient separation from obstacles.
- 10) Flight under abnormal conditions:
- a) manage the UAS flight path in abnormal situations;
 - b) manage the situation when the UAS positioning equipment is impaired (if the UAS used allows the deactivation of that equipment);
 - c) simulate the incursion of a person into the area of operation, and take appropriate measures to maintain safety;
 - d) manage the exit from the operation zone as defined during the flight preparation;
 - e) simulate the incursion of a manned aircraft nearby the area of operation;
 - f) simulate the incursion of another UAS in the area of operation;
 - g) select the safeguard mechanism relevant to the situation;
 - h) resume manual control of the UAS when the use of automatic systems renders the situation dangerous;
 - i) apply the recovery method following a deliberate (simulated) loss of the C2 link.
- 11) Briefing, debriefing and feedback:
- a) shut down the UAS and secure it;
 - b) carry out a post-flight inspection and record any relevant data on the general condition of the UAS (its systems, components, and power sources);
 - c) conduct a review of the UAS operation;
 - d) identify situations where an occurrence report is necessary, and complete the occurrence report.

SUBPART B – Competency requirements in category MIL-UAS SPECIFIC

AMC1 MAR.UAS.C.B.010 (1) general

The MIL-UAS operator could propose to the MAA-NLD as part of the application, a theoretical knowledge-training course for the remote pilot based on the elements that are listed in AMC1 MAR.UAS.C.A.020 Practical competencies, which are relevant for the intended operation.

GM1 MAR.UAS.C.B.010 (1) general

In general, a remote pilot is expected to hold a certificate as set in Annex A SUBPART A – RP competency requirements in category MIL-UAS-OPEN for operations in the MIL-UAS Specific category as a minimum. This certificate is a remote pilot competency proof, which shall be used as a basic qualification that satisfies the remote pilot competency requirements for VLOS operations within the Specific category.

AMC1 MAR.UAS.C.B.020 (a) UAS operations in MIL-UAS SPECIFIC

For operations in subcategory MIL-UAS SPECIFIC, additional theoretical knowledge is required. Before operating in the MIL-UAS Specific, the RP should be qualified in MIL-UAS-OPEN. Subjects for the basic online theoretical knowledge training courses and theoretical knowledge examinations should cover at least the following:

- 1) Aviation safety:
 - a) remote pilot records;
 - b) logbooks and associated documentation;
 - c) good airmanship principles;
 - d) aeronautical decision-making;
 - e) ground safety;
 - f) air safety;
 - g) air proximity reporting;
 - h) advanced airmanship:
 - i) maneuvers and emergency procedures; and
 - ii) general information on unusual conditions (e.g. stalls, spins, vertical lift limitations, autorotation).
- 2) Aviation regulations:
 - a) introduction to the NLD-MAR-UAS with focus on the 'specific' category;
 - b) risk assessment, introduction to the SORA;
 - c) overview of the STSs and the PDRA.
- 3) Navigation:
 - a) navigational aids (e.g. GNSS) and their limitations;
 - b) reading maps and aeronautical charts (e.g. 1:500 000 and 1:250 000, interpretation, specialised charts, helicopter routes, U-space service areas, and understanding of basic terms);
 - c) vertical navigation (e.g. reference altitudes and heights, altimetry).
- 4) Human performance limitations:
 - a) perception (situational awareness in BVLOS operations);
 - b) fatigue:
 - i) flight duration within work hours;
 - ii) circadian rhythm;
 - iii) work stress;
 - iv) vision problems;
 - v) commanders pressure;
 - c) inattentiveness:
 - i) eliminating distractions;

- ii) scan techniques;
 - d) medical fitness (health precautions, alcohol, drugs, medication, etc.);
 - e) environmental factors such as vision changes from orientation to the sun.
- 5) Airspace operating principles:
 - a) airspace classifications and operating principles;
 - b) procedures for airspace reservation;
 - c) aeronautical information publications (AIPs);
 - d) NOTAMs.
- 6) General knowledge of UAS and external systems that support the operation of UAS:
 - a) differences between autonomy levels (e.g. automatic versus autonomous operations);
 - b) loss of signal and system failure protocols — understanding the condition and planning for programmed responses such as returning to home, loiter, landing immediately;
 - c) equipment to mitigate air and ground risks (e.g. flight termination systems);
 - d) flight control modes;
 - e) the means to monitor the UA (its position, height, speed, C2 link, systems status, etc.);
 - f) the means to support air traffic awareness
- 7) Meteorology:
 - a) obtaining and interpreting advanced weather information:
 - i) weather reporting resources;
 - ii) weather reports;
 - iii) forecasts and meteorological conventions appropriate for typical UAS flight operations;
 - iv) local weather assessments;
 - v) low-level charts;
 - vi) understanding METAR, SPECI, TAF;
 - b) regional weather effects — standard weather patterns in coastal, mountain or desert terrains;
 - c) weather effects on the UA (wind, storms, mist, variation of wind with altitude, wind shear, etc.).
- 8) Technical and operational mitigation measures for air risks:
 - a) operations for which airspace observers (AOs) are employed;
 - b) principles of detect and avoid (DAA).
- 9) Operational procedures:
 - a) mission planning, airspace considerations, and site risk assessment:
 - i) measures to comply with the limitations and conditions applicable to the operational volume and to the ground risk buffer for the intended UAS operation;
 - ii) UAS operations over a controlled ground area;
 - iii) BVLOS operations;
 - iv) use of UA Vehicle Observers;
 - v) importance of on-site inspections, operation planning, pre-flight and operating procedures;
 - b) multi-crew cooperation (MCC):
 - i) coordination between the remote pilot and other personnel (e.g. AOs) in charge of duties essential to the UAS operation;
 - ii) crew resource management (CRM):
 - (1) effective leadership;
 - (2) working with other team members.
 - iii) Managing data sources regarding:
 - (1) where to obtain the data from;
 - (2) the security of the data;
 - (3) the quantity of the data needed;
 - c) Managing data sources regarding:

- i) where to obtain the data from;
- ii) the security of the data;
- iii) the quantity of the data needed;
- iv) the impact on the storage of data
- d) emergency response plan (ERP) — the MIL-UAS operator should provide its personnel with competency-based theoretical training covering the ERP that includes the related proficiency requirements and recurrent training.
- e) Both the training and the assessment should be appropriate to the level of automation of the intended UAS operation.

AMC1 MAR.UAS.C.B.020 (b) UAS operations in MIL-UAS SPECIFIC

For operations in subcategory MIL-UAS SPECIFIC additional practical-skills training and assessment for the RP are required. Appropriate simulators may be used to conduct some or all the tasks. Subjects should cover at least the following competencies:

- 1) Preparation of the UAS operation:
 - a) implement the necessary measures to comply with the limitations and conditions applicable to the operational volume and to the ground risk buffer for the intended UAS operation in accordance with the OM procedures;
 - b) follow the necessary procedures for UAS operations in controlled airspace, including a protocol to communicate with ATC and obtain clearance and instructions, if necessary;
 - c) confirm that all necessary documents for the intended UAS operation are on-site;
 - d) brief all participants on the planned UAS operation;
 - e) perform visual airspace scanning;
 - f) if AOs are employed, place them appropriately and brief them on the deconfliction scheme that includes phraseology.
- 2) Preparation for the flight:
 - a) ensure that all safety systems and functions, if installed on the UAS, including its height and speed limitation systems, flight termination system, and triggering system, are operational;
 - b) know the basic actions to be taken in the event of an emergency, including issues with the UAS, or a mid-air collision hazard arising during the flight.
- 3) Flight under abnormal conditions:
 - a) manage a partial or a complete power shortage of the UA propulsion system, while ensuring the safety of third parties on the ground;
 - b) manage a situation of a non-involved person entering the operational volume or the controlled ground area, and take appropriate measures to maintain safety;
 - c) react to, and take the appropriate corrective actions for, a situation where the UA is likely to exceed the limits of both the flight geography (contingency procedures) and of the operational volume (emergency procedures) as they were defined during the flight preparation.
- 4) Basically, the emphasis should be placed on the following:
 - a) normal, contingency, and emergency procedures;
 - b) operational experience (with on-the-job training counting towards proficiency);
 - c) pre-flight and post-flight procedures and documentation;
 - d) recurrent training (UAS/ flight training device (FTD));
 - e) remote pilot incapacitation.
- 5) The practical-skills training may be conducted with the UAS with a simulator deemed acceptable by the MAA-NLD. Scenario-based training (SBT) with highly structured, real-world experience scripts for the intended UAS operation should be used to fortify personnel's learning in an operational environment and improve situational awareness. SBT should include realistic normal, abnormal, and emergency scenarios that are drafted considering specific learning objectives.

- 6) The practical-skills training is checked during the assessment and can be provided using the actual UAS or an FTD appropriate to the intended UAS operation.
- 7) Initial and recurrent training.

AMC2 MAR.UAS.C.B.020 (b) UAS operations in MIL-UAS SPECIFIC

The remote pilot needs to complete the relevant operation-specific endorsement modules that reflect the intended UAS operation. The assurance level of the operation-specific endorsement modules is determined by the related assurance integrity level (e.g. SAIL) according to the respective specific operational risk assessment.

Relevant UAS operation-specific endorsement modules should be reflected in the documentation of the remote pilot's competencies. The following MIL-UAS SPECIFIC endorsement modules and the areas are identified below:

- (a) night operations;
- (b) overflight over populated areas or over assemblies of people (high risk ops ground) ;
- (c) BVLOS operations, operations planning, airspace, terrain, obstacles, expected air traffic and restricted areas;
- (d) highly automated operations
- (e) flights in non-segregated airspace (at more than 120m height AGL);
- (f) transport and/or dropping of cargo;
- (g) transport of dangerous goods;
- (h) operations with multiple UAS and swarms;
- (i) UA launch and recovery using special equipment and/or sensors;
- (j) flying over hilly environment, mountainous terrain, temperature inversions;
- (k) operations in controlled airspace & operations in aerodromes & heliports

AMC3 MAR.UAS.C.B.020 (b) UAS operations in MIL-UAS SPECIFIC

An additional practical-skills training and assessment for the RP shall include theoretical knowledge examination and a practical test.

The theoretical knowledge examination will comprise a minimum of 40 questions, which cover the syllabus sufficiently. The questions may be multiple choice, with a choice of no fewer than four answer options. The examination may be electronic, or paper based, but must be closed book format (i.e. without reference to external material). The pass mark shall be no less than 75%. If a candidate is re-sitting the examination, they shall answer a different set of questions.

The practical test element assesses whether the RP can safely undertake a range of BVLOS operations whilst adhering to procedures. The practical flying test will be conducted outdoors and at a location that is suitable for conducting the test (i.e. of suitable dimensions, volume and airspace class).

The test will include practical demonstrations of manoeuvres that display the RP's ability to safely position and control the aircraft. Manoeuvres may be demonstrated individually, or as part of a more generalised operating scenario; they must be clearly described and illustrated within the application documentation and will be subject to assessment for suitability during the approval process.

The practical test must be summarised in a written report that details the test scenario that was used, the maneuvers undertaken and an assessment of the examinee's performance for each 'section' of the test, along with guidance on areas for improvement where applicable. Reports must also contain details of the examinee, the assessor, any additional personnel involved and the date and location of the test.

ANNEX D: SPECIFIC OPERATIONS RISK ASSESSMENT (SORA)

AMC1 Subpart A General

In accordance with Article 11 of the NLD-MAR-UAS the applicant must collect and provide the relevant technical, operational and system information needed to assess the risk associated with the intended operation of the UAS. Each operational scenario shall be defined in a ConOps drafted under the operator responsibility.

Defining the characteristics of the operational scenario in which the UA flight will take place is the foundation for all other activities, and should be as accurate and detailed as possible. The operations description should not only describe the operation, but also identify the characteristics of the overflowed area (population density, sheltering, etc.) and the volume of the concerned airspace. The MAA-NLD may impose additional requirements.

The MIL-UAS Operator is accountable for the safe operation of the MIL-UAS, and hence the safety risk analysis. In accordance with Article 5 of the NLD-MAR-UAS, the MIL UAS operator must substantiate the safety of the operation by performing the specific operational and risk assessment, except for the cases defined by the same Article. The MIL-UAS operator shall use the SORA process as described in Article 11 and Annex D to check if the planned mission can be carried out safely using a given UAS.

The selected UAS has already undergone the verification process from COMMIT/LVS. The MIL-UAS operator will only verify that the intended operating conditions, the organisational structure, and the personnel competencies would properly support the safety of the mission.

AMC2 Subpart A General

For some UAS operations that are classified as being in the 'MIL-UAS-SPECIFIC' category and to avoid repetitive individual approvals, the MAA-NLD shall define 'Standard Scenarios' or 'predefined risk assessments' for the identified types of operations with known hazards and acceptable risk mitigations:

- (a) for MIL-UAS operations with lower intrinsic risks, a declaration may be submitted when the operations comply with the standard scenarios (STS)
- (b) for other MIL-UAS operations, a request for authorisation may be submitted based on the mitigations and requirements described in the predefined risk assessment when the UAS operation meets the operational characterisation.

GM1 Subpart A General

The Specific Operations Risk Assessment (SORA) developed for EASA, adapted, and customized in this document to the military type of UAS and the military type of operation. Aspects other than safety, such as security, privacy, environmental protection, the use of the radio frequency spectrum, etc., should be assessed in accordance with the applicable requirements in which the operation is intended to take place. For accomplishment of essential operational missions, the MAA-NLD can grant an exemption.

An operational risk assessment by a SORA provides a vision on how to safely create, evaluate and conduct a military UAS operation. The SORA provides a methodology to guide both the MIL-UAS operator and MAA-NLD in determining whether a MIL-UAS operation can be conducted in a safe manner and has to be used as an acceptable means to demonstrate compliance with Article 11 of the NLD-MAR-UAS. The document should not be used as a checklist, nor be expected to provide answers to all the challenges

related to the integration of the UAS in the airspace. The SORA is a tailoring guide that allows a UAS operator to find a best-fit mitigation means, and hence reduce the risk to an acceptable level. For this reason, it does not contain prescriptive requirements, but rather safety objectives to be met at various levels of robustness, commensurate with the risk.

The SORA methodology shall be applied where to an applicant's desire to operate a MIL-UAS in a limited or restricted manner. This methodology also support the activities necessary to determine the associated airworthiness requirements. This assumes that the safety objectives set forth in, or derived from, those applicable for the 'MIL-UAS-CERTIFIED' category, are consistent with the ones set forth or derived for the 'specific' category.

The methodology is based on the principle of a system safety risk-based assessment model used to evaluate the risks related to a given UAS operation. The model considers the nature of all the threats associated with a specified hazard, the relevant design, and the proposed operational mitigations for a specific UAS operation. The SORA helps to evaluate the risks systematically, and determine the boundaries required for a safe operation. This method allows the applicant to determine the acceptable risk levels, and to validate that those levels are complied with by the proposed operations.

The methodology shall be used to support waiving the regulatory requirements applicable to the operation if it can be demonstrated that the operation can be conducted with an acceptable level of safety.

GM2 Subpart A General

An operational risk assessment according to Article 11 and Annex D of the NLD-MAR-UAS aims at evaluating the safety risks involved with the operation of MIL-UAS of any class, size or any type of military operation (including swarming operations, concept development & experimental operations and prototyping) are subject to following conditions:

1. the safety risks associated with collisions between UA and manned aircraft shall be in the scope of the methodology;
2. the carriage of goods or payloads on board the UA (e.g. weapons and/or ammo) that present additional hazards are included in the scope;
3. security and cyber aspects are excluded from the applicability of this methodology when they are not limited to those confined by the airworthiness of the systems;
4. privacy aspects are excluded from the applicability of this methodology;
5. An applicant according to Article 11 makes an application on behalf of the MIL-UAS Operator and must collect and provide the necessary information needed to assess the risk associated with the intended operation with the UAS;
6. In addition to performing operational risk assessment in accordance with article 11 and Annex D of the NLD-MAR-UAS, the applicant must also ensure compliance with all the other regulatory requirements applicable to the operation that are not necessarily addressed by article 11.

GM1 MAR.UAS.D.B. 010 Step #1 - ConOps description

Step #1 provides an opportunity for the applicant to collect and present contextual information on the proposed operation and the intended safety claims made during Phase 1 of the SORA process and allows the applicant to continue through the SORA process.

GM1 MAR.UAS.D.B. 020 Step #2 – Determination of the intrinsic ground risk class

In the event that population density values are not available or not accurate enough the following approximations can be used as guidance.

Table D.01 determination of iGRC

Qualitative Descriptors	Quantitative Population Value (people/km ²)	Area Description
Controlled ground area / Extremely remote	-	Areas that are controlled where unauthorised people are not allowed to enter. Hard to reach areas (mountains, remote deserts, etc.), large bodies of water away from expected boat traffic, where it is reasonably expected that people will rarely be present.
Remote	< 5	Areas where people may be, such as forests, deserts, large farm parcels, etc. Areas where there is approximately 1 small building every km ² .
Lightly populated	< 50	Areas of small farms. Residential areas with very large lots (~ 4 acres or 16,000 m ²).
Sparsely populated / Residential lightly populated	< 500	Areas comprised of homes and small businesses with large lot sizes (~1 acre or 4,000 m ²).
Suburban / Low density metropolitan	< 5,000	Areas of single-family homes on small lots, apartment complexes, commercial buildings, etc. Can contain multistore buildings, but generally most should be below 3-4 stories.
High density metropolitan	< 50,000	Areas of mostly large multistore buildings. The downtown area of most cities. Areas of dense skyscrapers.
Assemblies of people	> 50,000	The densest areas in the largest cities. Large gatherings of people such as professional sporting events, large concerts, etc.

Determining the population density to calculate the iGRC should be done using maps with appropriate grid size based on the operation.

If there are no population density maps available, the qualitative population density descriptors may be used to estimate the population density band in the operational volume and ground risk buffer.

Alternatively, the MAA-NLD may require or permit applicants to provide appropriate population density maps.

Table D.02 optimal grid size for different maximum operating heights

Maximum height (AGL)	Optimal grid size
500 ft. / 152 m	> 200 x 200 m
1000 ft. / 305 m	> 400 x 400 m
2500 ft. / 762 m	> 1000 x 1000 m
5000 ft. / 1524 m	> 2000 x 2000 m
10000 ft. / 3048 m	> 4000 x 4000 m
20000 ft. / 6096 m	> 5000 x 5000 m
60000 ft. / 18288 m	> 10000 x 10000 m

If mapping products do not exist at the optimal grid size, the closest grid size available should be used. If the closest grid size available is smaller than the suggested optimal grid size, then the map should be smoothed to the optimal grid size.

GM2 MAR.UAS.D.B. 020 Step #2 – Determination of the intrinsic UAS ground risk class

The iGRC can also be calculated using formulas from the JARUS SORA v2.5 source documents. The MAA-NLD created a tool that calculates the iGRC using these formulas. This tool will be made available for use on the MAA-NLD intranet. The use of this tool is allowed provided the settings used in this tool are agreed upon by the MAA-NLD.

GM1 MAR.UAS.D.B. 030 Step #3 - Final GRC determination

The intrinsic risk of a person being struck by the UA during a loss of control of the operation can be reduced by means of acceptable mitigations. In this step, the MIL-UAS operator may identify ground risk mitigations and reduce the GRC of the operation.

Operational airspace defined in Step 1 is the baseline to evaluate the intrinsic risk of mid-air collision with manned aircraft and for determining the air risk class (ARC). The ARC may be modified/lowered by applying strategic and tactical mitigation means. An example of strategic mitigations to reduce collision risk may be by operating during certain times or within certain boundaries. After applying strategic mitigations, any residual risk of mid-air collision is addressed by means of tactical mitigations. Tactical mitigations take the form of detect and avoid systems or alternate collaborative means, such as ADS-B systems. Depending on the residual risk of mid-air collision, the Tactical Mitigation Performance Requirement(s) may vary.

GM1 MAR.UAS.D.B. 040 Step #4 - Determination of the initial Air Risk Class (ARC)

Operational airspace defined in Step 1 is the baseline to evaluate the intrinsic risk of mid-air collision with manned aircraft and for determining the air risk class (ARC). The ARC may be modified/lowered by applying strategic and tactical mitigation means. An example of strategic mitigations to reduce collision risk may be by operating during certain times or within certain boundaries. After applying strategic mitigations, any residual risk of mid-air collision is addressed by means of tactical mitigations. Tactical mitigations take the form of detect and avoid systems or alternate collaborative means, such as ADS-B systems. Depending on the residual risk of mid-air collision, the Tactical Mitigation Performance Requirement(s) may vary.

AMC1 MAR.UAS.D.B. 050 Step #5 Strategic mitigations to determine the residual ARC

A MIL UAS operator who wishes to demonstrate to the MAA-NLD that the risk of a mid-air collision in the operational volume is acceptably safe, and, to obtain approval to operate in the particular airspace may reduce the initial air risk class (ARC) assignment by using strategic mitigations to reduce the collision risk.

A MIL UAS operator shall propose and demonstrate the suitability and effectiveness of its strategic mitigations by providing an assessment with qualitative and where possible, augmented with quantitative data to support the qualitative assumptions and decisions to the MAA-NLD.

GM1 MAR.UAS.D.B. 050 Step #5 - Strategic mitigations to determine the residual ARC

The ARC is a qualitative classification of the rate at which a UAS would encounter a manned aircraft in a given airspace environment but a UAS operational volume may have a collision risk that differs from the initial ARC assigned. Annex C to AMC1 of Article 11 of Cover Regulation to Implementing Regulation (EU) 2019/947 can be used as a guideline.

GM1 MAR.UAS.D.B.080 Step #8 Identification of the Operational Safety Objectives

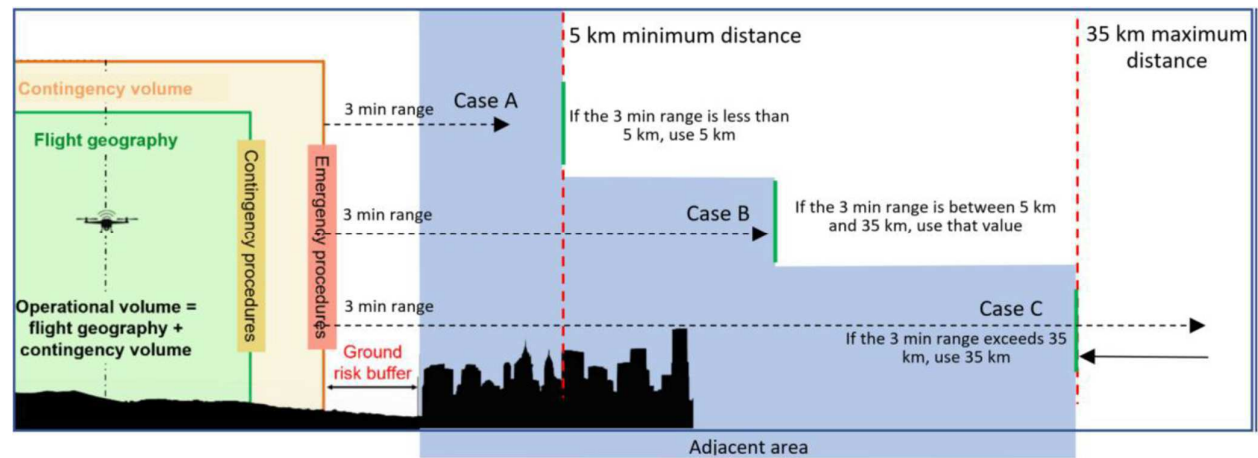
Table D.03 guidance on OSOs.

OSO	Guidance
07	The intent of this OSO is to ensure that the UAS used for the operation conforms to the UAS data used to support the approval/authorisation of the operation.
09 15 22	The applicant needs to propose competency-based, theoretical and practical training that: (1) is appropriate for the operation to be approved; and (2) includes proficiency requirements and recurrent training. The entire remote crew (i.e. any person involved in the operation) should undergo competency-based, theoretical and practical training specific to their duties (e.g. pre-flight inspection, ground equipment handling, evaluation of the meteorological conditions, etc.). The MAA-NLD will accept RP licenses according to NLD-MAR-MRPL for High robustness.
13	For the purpose of SORA and this specific OSO, the term 'external services supporting UAS operations' encompasses any service providers necessary for the safety of the flight, such as communication service providers (CSPs) and U-space service providers. External service should be understood as any service that is provided to the UAS operator, which is necessary to ensure the safety of a UAS operation and is provided by a service provider other than the UAS operator. Examples of external services are:

OSO	Guidance
	- requirement of geographical zones data and geographical limitations (including orography); - collection and transfer of occurrence data; - training and assessment of remote pilots; - communication services that support the C2 link and any other safety-related communication; - services that support navigation, e.g. GNSS services (compliance with requirement UAS.STS-01.030(6) could be ensured by referring to the conditions of use of such services in the corresponding Service Definition Document (SDD) or an equivalent one if available.); - requirement of services related to flight planning and management, including related safety assessments; and - U-space services, which are defined in the corresponding regulation(s) and may include one or more of the above-mentioned services.
16	This OSO applies only to those personnel directly involved in the flight operation.
17	For the purpose of this assessment, the expression 'fit to operate' should be interpreted as physically and mentally fit to perform their duties and safely discharge their responsibilities. Fatigue and stress are contributory factors to human error. Therefore, to ensure that vigilance is maintained at a satisfactory level of safety, consideration may be given to the following: (1) remote crew duty times; (2) regular breaks; (3) rest periods; and (4) handover/takeover procedures.
19.1 19.2	This OSO addresses the risk of human errors, which may affect the safety of the operation if not prevented or detected and recovered in a timely fashion. (1) Errors can be made by anyone involved in the operation. (2) An example could be a human error leading to the incorrect loading of the payload, with the risk of it falling off the UA during the operation. (3) Another example could be a human error not to extend the antenna mast, thus reducing the C2 link coverage. Note: the flight envelope protection is excluded from this OSO since it is specifically covered by OSO #18. This OSO covers: (1) procedures and lists; (2) training.

GM1 MAR.UAS.D.B.090 Size of the adjacent area

Figure D.01 1.2 lateral limits - adjacent area size.



If the ground risk buffer is larger than the adjacent area then the assessment of adjacent area is not required.

If the ground risk buffer size exceeds 1 km, the adjacent area consideration for all assemblies of people is not applicable.

AMC1 Step #10 Comprehensive safety portfolio

The final step of the SORA involves the compilation of the CSP.

The CSP is a structured argument using the SORA process, that is supported by a body of evidence which provides a robust safety case. This demonstrates that the proposed operation has been assessed correctly and meets its SORA objectives.

A completed Comprehensive Safety Portfolio has to be provided to the MAA-NLD for the application for the operational authorisation. By documenting all elements of the SORA, the MAA-NLD can assess a standardised document suite that provides assurance that the SORA process has been completed correctly and the operation can be conducted safely.

- The applicant should only put information into the CSP as required by the items mentioned above. If a requirement has a low robustness it is mostly sufficient to self-declare the compliance by a statement in the CSP. SORA requirements for self-declaration in no way prevents the competent authority from requesting further documents to validate the declaration, if considered necessary for the given operation;
- The CSP is expected to be a collection of documents specific to the operation(s). It can be modularised and consist of multiple sub-documents and sub-sections to accommodate the need to perform the intended operation(s);
- Appropriate references and version/configuration control apply to all documents in the CSP, including subsections and sub-documents. Any changes may require a separate process from the MAA-NLD. The management of any changes should follow the relevant MAA-NLD's requirements;
- A completed and valid CSP forms the basis for the issue of an operational approval;
- In the case the operator uses external service(s), reference(s) to Service Level Agreement(s) (SLA) providing a delineation of responsibilities between the Service Provider(s) and the operator should be included as part of the CSP. It should also detail the functionality, limitations and performance of the service.

Final Clauses

The Hague, 01 March 2026

The Director of the Military Aviation Authority — The Netherlands

A handwritten signature in blue ink, consisting of a stylized 'A' and 'W' intertwined, with a horizontal line extending to the left.

Mr. drs. A.A.W.K. Appels,
Commodore