STAATSCOURANT
Officiële uitgave van het Koninkrijk der Nederlanden sinds 1814.
Nr. 20938
18 november 2011

Beschikking van de Staatssecretaris van Infrastructuur en Milieu, houdende de instelling van een bijzonder luchtverkeersgebied Kraggenburg en ontheffing van artikel 3.8 en artikel 2.1, eerste lid, van de Wet luchtvaart

14 november 2011
Nr. IENM/IVW-2011/8479-305

De Staatssecretaris van Infrastructuur en Milieu,

Handelende in overeenstemming met de Minister van Defensie;

Gelezen het verzoek van Ampyx Power B.V. van 29 augustus 2011; Contactpersoon dhr R. Ruiterkamp; adres: Lulofsstraat 55–28, 2521 AL Den Haag;

Gelet op:
– artikel 2.1, vierde lid, van de Wet luchtvaart;
– artikel 3.21, eerste lid, van de Wet luchtvaart;
– artikel 8 van het Luchtverkeersreglement;

Besluit:

Artikel 1

1. De hierna genoemde testvliegers van Ampyx Power B.V. wordt ontheffing verleend van het verbod in artikel 2.1, eerste lid, van de Wet luchtvaart, voor het maken van testvluchten met het lichte onbemande zweefvliegtuig PowerPlane Experimental, zonder in het bezit te zijn van een geldig bewijs van bevoegdheid:
   a. R. Ruiterkamp-Beneder (geboren 18 september 1972 te Utrecht);
   b. S. Sierberling (geboren 8 mei 1983).

2. Ingevolge artikel 3.21, eerste lid, van de Wet luchtvaart wordt aan Ampyx Power B.V. ontheffing verleend van het verbod in artikel 3.8 van de Wet luchtvaart als exploitant voor het maken van testvluchten met het lichte onbemande zweefvliegtuig PowerPlane Experimental, zonder dat het luchtvaartuig is voorzien van een geldig bewijs van luchtwaardigheid, bewijs van inschrijving en nationaliteits- en inschrijvingskenmerken.

Artikel 2

1. Aan de ontheffing worden de in bijlage 1 opgenomen voorschriften en beperkingen verbonden.

2. Het terrein waarvan wordt gestart en waarop wordt geland met het UAS moet voldoen aan de eisen in artikel 33 van de Regeling veilig gebruik luchthavens en andere terreinen (zie www.overheid.nl). Ingevolge de Regeling Burgerluchthavens en Militaire Luchthavens en de gewijzigde Wet luchtvaart is een Regeling (voor permanent gebruik) of 'ontheffing tijdelijk en uitzonderlijk gebruik' nodig van de provincie. Deze vergunningen moeten door Ampyx Power B.V. zelf worden aangevraagd bij de desbetreffende provincie(s).

Artikel 3

Deze beschikking treedt in werking op de eerste dag na dagtekening van de Staatscourant waarin zij wordt geplaatst en vervalt op 1 maart 2012.

De Staatssecretaris van Infrastructuur en Milieu,
voor deze:
de Senior Adviseur IVW/Luchtvaart,
A.E. Schurink-v.d. Klugt.

Bezwaarclausule

Indien u het niet eens bent met deze beslissing kunt u hiertegen, op grond van het bepaalde in de Algemene wet bestuursrecht, binnen zes weken na datum waarop deze beslissing is verzonden schriftelijk bezwaar aantekenen.

Het bezwaarschrift moet worden ondertekend en moet ten minste bevatten:
– de naam en het adres van de indiener;
– de dagtekening;
– een omschrijving van het besluit waartegen het bezwaar is gericht;
– de gronden van het bezwaar.

Het bezwaarschrift kunt u richten aan:
Inspectie Verkeer en Waterstaat
Toezicht Beheereenheid
Unit Juridische Zaken
Postbus 90653
2509 LR DEN HAAG

BIJLAGE 1

Voorschriften en beperkingen bij de beschikking aangaande de ontheffing van Ampyx Power B.V.

I. Vluchtuitvoering

Extern besturingsstation

Het besturingsstation waarmee het onbemande luchtvaartuig op afstand wordt bediend en dat fysiek niet verbonden is met het onbemande luchtvaartuig.
De ontheffing is beperkt tot testvluchten in het geactiveerde BVG Kraggenburg
Het gaat om testvluchten,

- die niet boven personen, constructies, gebouwen, vaartuigen of voertuigen plaatsvinden,
- waarbij de horizontale afstand tussen het onbemande luchtvaartuig en personen, constructies, gebouwen, vaartuigen en voertuigen ten minste 50 meter bedraagt en
- waarbij het luchtvaartuig binnen het gezichtsveld/Visual Line of Site (hierna te noemen: VLOS) van de piloot blijft.

VLOS wil in ieder geval zeggen wanneer de afstand van het luchtvaartuig tot de piloot, die het externe besturingsstation bedient, maximaal 500 meter en de vlieghoogte maximaal 120 m boven het aardoppervlak (400 ft AGL) bedraagt.
Het lichte onbemande luchtvaartuig heeft een maximale snelheid van 70 knopen.

Vaststelling maximale afstand lichte onbemande luchtvaartuig en het externe besturingsstation

De exploitant garandeert dat de vluchtuitvoering binnen het gezichtsveld plaatsvindt. Bij het bepalen van de maximale afstand tussen het lichte onbemande luchtvaartuig en het externe besturingsstation houdt de exploitant in ieder geval rekening met het formaat van het onbemande luchtvaartuig en de weersomstandigheden ten tijde van de vluchtuitvoering.

Gezichtsveld

De afstand tussen het lichte onbemande luchtvaartuig en het externe besturingsstation waarbij het lichte onbemande luchtvaartuig en het omringende gebied op de grond en het luchtruim duidelijk door het menselijk oog kunnen worden waargenomen, zonder dat gebruik wordt gemaakt van bijzondere visus versterkende hulpmiddelen, anders dan een standaard bril of contactlenzen. Binnen gezichtsveld wil in ieder geval zeggen dat de afstand van het onbemande luchtvaartuig tot het externe besturingsstation maximaal 500 meter bedraagt.

Operationeel handboek

De exploitant stelt een operationeel handboek vast op basis waarvan iedere vlucht wordt uitgevoerd.

Manuele besturing

Ingeval er geen sprake is van manuele besturing van het onbemande luchtvaartuig, zorgt de exploitant er voor dat het onbemande luchtvaartuig altijd wanneer dat nodig zou zijn manueel bestuurd kan worden.

Gezagvoerder

De exploitant wijst voor de desbetreffende vlucht een gezagvoerder aan die het onbemande luchtvaartuig bedient met het extern besturingsstation en onder wiens verantwoordelijk de UAS vlucht wordt uitgevoerd.
Voor de vlucht neemt de gezagvoerder kennis van alle gegevens en inlichtingen die voor de uitvoering van de vlucht van belang kunnen zijn.[1]

Observant

De exploitant wijst naast de gezagvoerder voor de desbetreffende vlucht een observant aan. Het is de taak van de observant om de gezagvoerder te voorzien van informatie over de omgeving en de

[1] Zoals weersomstandigheden en -verwachtingen, ter plaatse geldende luchtverkeersregels en eventuele bijzondere omstandigheden, bekend gemaakt in berichten aan luchtvarenden (NOTAMS).

daarmee samenhangende botsingsrisico's en zonodig daaromtrent instructies te geven.

Verzekeringsplicht

a. Een bedrijf dat of organisatie die vluchten uitvoert met lichte UAS is verzekerd van aansprakelijkheid bij ongevallen al dan niet resulterend in schade of letsel ten aanzien van derden.
b. Het bedrijf of de organisatie voldoet ten minste aan de verzekeringseisen zoals deze zijn vastgelegd in Verordening (EG) nr. 785/2004 van het Europees Parlement en de Raad van 21 april 2004, betreffende de verzekeringseisen voor luchtvervoerders en exploitanten van luchtvaartuigen.

Verbroken communicatie

De exploitant stelt voor iedere vlucht ten minste één veilige positie voor het onbemande luchtvaartuig vast voor die gevallen, waarbij de communicatie tussen het onbemande luchtvaartuig en het extern besturingsstation verbroken wordt.

Operationeel plan

De exploitant stelt voor iedere vlucht een plan vast waaruit in ieder geval volgt dat de risico's worden gemitigeerd van een mogelijke botsing met overig luchtverkeer dan wel personen en gebouwen op de grond.

Voorvalmeldingen

1. De exploitant meldt *voorvallen en ernstige incidenten* binnen 72 uur aan het Analyse Bureau Luchtvaartvoorvallen van de Inspectie Verkeer en Waterstaat, ingevolge de Regeling melding voorvallen in de burgerluchtvaart. Zie www.ivw.nl onder 'luchtvaart voorval melden' en www.ais-netherlands.nl voor AIC-B 02/10.
2. *Ongevallen* (=met gewonde(n) of dode(n)) moeten (na de hulpverleningsoproep) direct worden gemeld aan
   a. het OVV via 0800 MELDOVV of 0800 6353 688, en
   b. de crisiscoördinator van IVW 070 456 3434
3. De exploitant registreert ook alle incidenten (inclusief risicovolle situaties die goed afliepen) in het kader van het eigen veiligheidsmanagement.

Meldingsplicht tijdelijk en uitzonderlijk gebruik luchtvaartterrein

Ingevolge artikel 35, derde lid, van de Regeling veilig gebruik luchthavens en andere terreinen meldt de houder van de ontheffing ten minste 24 uur voor de dag dat het terrein zal worden gebruikt dit voornemen schriftelijk of per e-mail aan de minister en de burgemeester van de gemeente waarin het betreffende terrein ligt. De melding aan de minister kan worden gedaan door het sturen van een e-mail aan meldingtug@ivw.nl

Daglichtperiode

UAS vluchtuitvoering vindt uitsluitend plaats gedurende de daglichtperiode, genoemd in artikel 1 van het Luchtverkeersreglement en gepubliceerd in de luchtvaartgids.(zie www.ais-netherlands.nl onder GEN 2.7)

II. Luchtruim

Algemene en zichtvliegvoorschriften

De vluchten worden uitgevoerd binnen het geactiveerde BVG Kraggenburg onder algemene en zichtvliegvoorschriften[2] en uitsluitend binnen luchtruim met de klasse G.

Minimum en maximum hoogte

De vlucht wordt uitgevoerd op zodanige hoogte dat het altijd mogelijk is een noodlanding uit te voeren zonder personen of zaken op het aardoppervlak in gevaar te brengen, maar niet hoger dan 120 meter boven de grond of het water (400 ft AGL);

[2] In respectievelijk afdeling 2 en 3 van het Luchtverkeersreglement en onderliggende regelingen.

Overschrijding maximum hoogte

De maximum hoogte van 400 ft. AGL mag worden overschreden en er mag worden gevlogen in luchtruim met de klasse E of D in een bijzonder luchtverkeersgebied wanneer dat voor dit doel is ingesteld op basis van artikel 5.10 Wet luchtvaart of artikel 8 Luchtverkeersreglement.

Goed zicht op het lichte onbemande luchtvaartuig en luchtruim

De vlucht wordt slechts uitgevoerd onder omstandigheden en op locaties waarbij de bestuurder vanaf de grond tijdens de gehele vlucht goed zicht heeft op het lichte onbemande luchtvaartuig en het luchtruim daaromheen of ten minste een reëel beeld heeft van de positie van het luchtvaartuig en de omgeving zodat de bestuurder zo nodig tijdig een uitwijkmanoeuvre kan uitvoeren, zonder dat daarbij hulpmiddelen hoeven te worden gebruikt met uitzondering van een bril of contactlenzen of de afstand van 500 meter wordt overschreden.

Informatievoorziening bestuurder of gezagvoerder

De bestuurder of de gezagvoerder moet door het systeem worden voorzien van informatie over de hoogte ten opzichte van grond of water of ten opzichte van het gemiddeld zeeniveau waarop het luchtvaartuig zich bevindt.

III. Vermoeidheid en fitheid personeel

Personeel dat gemoeid is met de vluchtvoorbereiding of -uitvoering van het lichte UAS werkt niet met het systeem indien er sprake is van een omstandigheid waarbij vermoeidheid of een gevoel van niet fit zijn een gevaar voor de luchtwaardigheid of de vlucht zou kunnen opleveren.

IV. Technische staat, onderhoud

De exploitant controleert het UAS, onderhoudt het of laat het onderhouden en zo nodig modificeren volgens de aanwijzingen van de fabrikant.

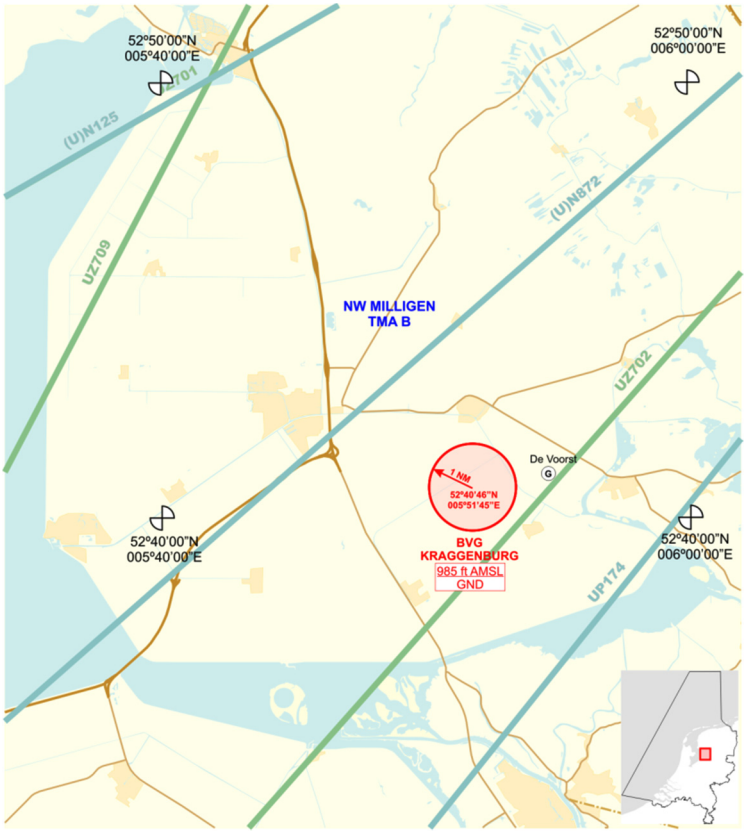
BVG Kraggenburg 2011

Gelet op artikel 8 van het Luchtverkeersreglement;

Besluit:

Artikel 1

Ter bescherming van het luchtverkeer tijdens het uitvoeren van testvluchten met een licht onbemand zweefvliegtuig aan een kabel in de gemeente Noordoostpolder nabij Kraggenburg wordt als bijzonder luchtverkeersgebied aangewezen het gebied (zie figuur 1):
– begrensd door een cirkel met een straal van 1 NM rondom de positie 52°40’46”NB en 005°51’45”OL;
– vanaf de grond tot een hoogte van 300 meter (985 ft AMSL) boven gemiddeld zeeniveau;
– vanaf 15 september 2011 tot 1 maart 2012.



Figuur 1 BVG Kraggenburg

Artikel 2

Binnen het bijzondere luchtverkeersgebied gelden de volgende regels:

a. Bij het uitvoeren van vluchten binnen het gebied moet rekening worden gehouden met obstakels in de vorm van een licht onbemand zweefvliegtuigaan een bijbehorende slecht zichtbare kabel l.
b. Het lichte onbemande zweefvliegtuig mag niet hoger vliegen dan 300 m boven gemiddeld zeeniveau en niet in of door de laagste bewolking, inclusief flarden.
c. Het lichte onbemande zweefvliegtuig mag alleen boven de 100 m vliegen wanneer het grondzicht 5 km of meer bedraagt.
d. De organisatie van Ampyx Power B.V. neemt ten minste 30 minuten voor het laten vliegen van het lichte onbemande zweefvliegtuig en direct na het landen ervan contact op met AOCS NM (tel. 0577-45 83 21) en de Zweefvliegclub Noordoostpolder (tel. 0527-20 13 64) en blijft telefonisch bereikbaar met het telefoonnummer 06-21885247 (de Range Safety Officer).
e. Aanwijzingen van KLPD, militaire luchtverkeersleiding of de Inspectie Verkeer en Waterstaat in het kader van de veiligheid van het luchtverkeer, moeten worden nagekomen.
f. Activatie van de BVG wordt minimaal 5 dagen van te voren bekendgemaakt via een NOTAM, uit te geven door AOCS NM op aanvraag van Ampyx Power. Een NOTAM kan het gebied voor meerdere dagen activeren.

V. FCL UAS eisen (voor nieuw op te leiden vliegers)

Daar het gebruikelijk is in het internationale verkeer om eisen t.a.v. Flight Crew Licensing (FCL) in het Engels te stellen, zijn de FCL voorschriften voor lichte UAS, klasse 1 vanuit het gebruiksgemak en de usance in het Engels gesteld.

Gereral requirements

Flying Training Organisation or Registered Operator.

The training organisation (TO) or Registered Operator (RO) shall ensure compliance with all relevant UAS requirements as set in this document. The procedures shall include a quality system to readily detect any deficiencies for self-remedial action.

The TO or RO shall be registered by at local Authority according to Appendix 1.

The management structure shall ensure supervision of all grades of staff by persons having the experience and qualities necessary to ensure the maintenance of high standards. Details of the management structure, indicating individual responsibilities, shall be described.

The Head of Training (HT) shall have overall responsibility for ensuring satisfactory integration of flying training, synthetic flight training and theoretical knowledge instruction, and for supervising the progress of individual students. The HT shall have had extensive experience in training as a flight instructor for professional pilot licences and possess a sound managerial capability.

Instructors shall have appropriate experience relevant to the part of the course being conducted.

The TO shall maintain and retain the following records for a period of at least 5 years, using appropriate administrative staff:
(a) details of ground and flying training given to individual students;
(b) detailed and regular progress reports from instructors including assessments, and regular progress flight tests and ground examinations; and
(c) personal information, e.g. expiry dates of medical certificates, ratings, etc.

A training programme shall be developed for each type of course offered. This programme shall include a breakdown of flying and theoretical knowledge instruction in either a week-by-week or phase presentation, a list of standard exercises and a syllabus summary. In particular theoretical knowledge instruction shall be phased in such a manner as to ensure that students shall be able to apply to flying exercises the knowledge gained on the ground.

The UAS shall be suitably equipped for training and testing.

The Training Manuals shall state the standards, objectives and training goals for each phase of training that the students are required to comply with

Minimum age

An applicant for a UAS VLOS Licence shall be at least 18 years of age.

Privileges and conditions

Privileges are to act as pilot of UAS engaged in VLOS operations.

Theoretical knowledge

Course; an applicant shall have completed theoretical knowledge instruction according to the learning objective as described in Appendix 5.

Flight instruction

An applicant shall have completed a course of flying training. As described in Appendix 2.

Skill

An applicant shall have demonstrated the ability to perform as pilot-in-command of an UAS the relevant procedures and with a degree of competency appropriate to the privileges granted. As described in Appendix 3.

Appendix 1

Registration of VLOS UAS operators or TO

- The owner or responsible person in charge of the facility shall make an application for acceptance of registration to the National Aviation Authority (NAA) in which the facility is located.[3]
- Upon receipt of the application form the NAA will register the facility without formal approval procedure. (Unless it has reason to doubt that the operation can be carried out safely.)

[3] NAA in Nederland = CAA-NL = Inspectie Verkeer en Waterstaat

- Any changes to the information entered on this form shall be communicated to the Authority. (Eg. Names of UAS crew)
- Registration has to be revalidated every year. For revalidation the operator has to provide the NAA a report of activities carried out during the previous period.
- Registration can be revoke by the Authority when it is establishes that the operation is not being carried out safely and/or not in compliance with regulations.

Requirements:

- Completion of registration form:
  - Name, address, website and e-mail address under which the facility operates.
  - Name of Owner(s), address, and e-mail;
  - Date of intended commencement of operations;
  - Name, address, e-mail and telephone number of postholders;
  - Type of operation to be conducted by the facility;
  - Details of aircraft insurance held;
  - Any additional information the Authority may require;
  - A declaration below by the applicant that the information provided above is correct and that operation will be conducted in accordance with the operations manual.
- List of UAS to be used.
- List of crew names.

Appendix 2

VLOS Licence Course

The aim of the UAS VLOS Licence course is to train applicants to the level of proficiency necessary to exercises his privileges granted safely

The course shall comprise:
(a) theoretical knowledge instruction to UAS VLOS knowledge level; and
(b) visual flying training.

Theoretical knowledge instruction.

1 The theoretical knowledge instruction shall be conducted by an authorised instructor holding the appropriate type rating or any instructor having appropriate experience in aviation and knowledge of the UAS concerned, e.g. maintenance engineer, flight operations officer.
2 The theoretical knowledge instruction shall cover the syllabus, as appropriate to the UAS type concerned. Depending on the equipment and systems installed, the instruction shall include but is not limited to the following contents:
   (a) UAS structure, transmissions, rotor[4] and equipment, normal and abnormal operation of systems.
      – Dimensions
      – Engine, if applicable, including aux. power unit, rotors* and transmissions
      – Fuel system
      – Hydraulic system
      – Landing gear
      – Flight controls, stability augmentation and autopilot systems
      – Electrical power supply
      – Flight instruments, communication, radar and navigation equipment
      – Control station or equivalent
      – Emergency equipment
   (b) Limitations
      – General limitations, according to the UAS flight manual
      – Minimum equipment list
   (c) Performance, flight planning and monitoring
      – Performance
      – Flight planning
   (d) Load and balance and servicing
      – Load and balance
      – Servicing on ground
   (e) Emergency procedures

[4] As applicable to the specific UAS.

(f) Optional equipment

3 For proficiency checks UAS theoretical knowledge shall be verified by a multi-choice questionnaire or other suitable methods, as accepted by the Authority.

Syllabus of theoretical instruction for UAS types.

Detailed listing

1	UAS structure, transmissions, rotors[1] and equipment, normal and abnormal operation of systems.
1.1	Dimensions
1.2	Engine including aux. power unit, rotor[1] and transmissions; if an initial type rating for a turbine engine UAS is applied for, the applicant shall have received turbine engine instruction
1.2.1	type of engine/engines
1.2.2	in general the function of the following systems or components: – engine – aux. power unit – oil system – fuel system – ignition system – starting system – fire warning and extinguishing system – generators and generator drives – power indication
1.2.3	engine controls (including starter), engine instruments and indications, their function and interrelation and interpretation
1.2.4	engine operation, including APU, during engine start and engine malfunctions, procedures for normal operation in the correct sequence
1.2.5	transmission system: – lubrication – generators and generator drives – freewheeling units – hydraulic drives – indication and warning systems
1.2.6	type of rotor[1] systems - indication and warning systems
1.3	Fuel system
1.3.1	location of the fuel tanks, fuel pumps, fuel lines to the engines tank capacities, valves and measuring
1.3.2	the following systems: – filtering – fuelling and de-fuelling heating – dumping – transferring – venting
1.3.3	at the control station the monitors and indicators of the fuel system, quantity and flow indication, interpretation
1.3.4	fuel procedures distribution into the various tanks fuel supply and fuel dumping
1.5	Ice and rain protection,
1.5.1	ice protected components of the UAS, including engines and rotor[1] systems, heat sources, controls and indications
1.5.2	operation of the anti-icing/de-icing system during T/O, climb, cruise and descent, conditions requiring the use of the protection systems
1.6	Hydraulic system
1.6.1	components of the hydraulic system(s), quantities and system pressure, hydraulically actuated components associated to the respective hydraulic system
1.6.2	controls, monitors and indicators at the control station, function and interrelation and interpretation of indications
1.7	Landing gear, skids fixed, floats
1.7.1	main components of the – main landing gear – nose gear – tail gear – gear steering – wheel brake system
1.7.2	gear retraction and extension
1.7.3	controls and indicators including warning indicators in relation to the retraction/extension condition of the landing gear
1.8	Flight controls, stab-and autopilot systems
1.8.1	controls, monitors and indicators including warning indicators of the systems, interrelation and dependencies
1.9	Electrical power supply
1.9.1	Number, power, voltage, frequency and if applicable phase and location of the main power system (AC or DC)
1.9.2	location of the controls, monitors and indicators.
1.9.3	main and back-up power sources flight instruments, communication and navigation systems, main and back-up power sources
1.9.4	location of vital circuit breakers
1.9.5	generator operation and monitoring procedures of the electrical power supply
1.10	Flight instruments, communication, radar and navigation equipment, auto-flight
1.10.1	antennas eg. position and location
1.10.2	controls and instruments of the following equipment: – flight instruments (e.g. airspeed indicator, pitot static system, compass system, flight director) – flight management systems – communication and navigation system (e.g., VHF,) and area navigation systems (e.g. GPS,) – stabilisation and autopilot system – flight data recorder – test functions of the AFCS Auto Flight Control System

1.10.3	Data Link – Data Link Frequencies – Limitations of related data link frequencies (obstacles/interference of other transmitters.) – Relevant data link protocols – Effect of EMC Electro-Magnetic- Compatibility and EMI Electro-Magnetic Interference
1.10.4	Pilot Station – All installed equipment (how to use, limitations, functions etc.) – Verification of correct operation of all installed equipment – Software – Description of Software – Function – Flight modes
1.12	Emergency equipment Operation and correct application of the following emergency equipment: – portable fire extinguisher – first aid kits
2	LIMITATIONS
2.1	General limitations, according to the UAS flight manual
2.2	Minimum equipment list
3	PERFORMANCE, FLIGHT PLANNING AND MONITORING
3.1	Performance Performance calculation concerning speeds, gradients, masses in all conditions for take-off, en route, approach and landing
3.1.1	Take off – hover performance in and out of ground effect – take off and rejected take off distance – climb performance
3.1.2	En-route – max endurance – max range – cruise climb performance
3.1.3	Landing – hovering in and out of ground effect – landing distance
3.1.4	Knowledge and/or calculation of Vx, Vy, , Vne, Vmax range
3.2	Flight planning Flight planning for normal and abnormal conditions – optimum/maximum flight level – minimum required flight altitude – drift down procedure after an engine failure during cruise flight – power setting of the engines during climb, cruise and holding under various circumstances as well as at the most economic cruising flight level – optimum and maximum flight level and power setting after an engine failure
4	LOAD, BALANCE AND SERVICING
4.1	Load and balance – load and trim sheet with respect to the maximum masses for take-off and landing – centre of gravity limits
4.2	Payload Dimensions/weight limitations. Securing methods Control of related payload devices
4.3	Servicing on the ground servicing connections for – fuel – oil – etc. Safety regulations for servicing
5	EMERGENCY PROCEDURES

[1] As applicable to the specific UAS.

Appendix 3

Skill test for the issue of the UAS VLOS Licence

– An applicant for a skill test shall have satisfactorily completed all of the required training, including instruction on the same type of UAS to be used in the test.
– An applicant shall pass sections 1 through 6 of the skill test. Failure in more than one section will require the applicant to take the entire test again. If any item in a section is failed, that section is failed. An applicant failing only one section shall take the failed section again. Failure in any items of the re-test and failure in any other items already passed, will require the applicant to take the entire test again. All sections of the skill test shall be completed within six months.
– Further training may be required following any failed skill test. Failure to achieve a pass in all sections of the test in two attempts shall require further training. There is no limit to the number of skill tests that may be attempted.

Conduct of the test

- The Registered Operator or TO will provide the Examiner with adequate safety advice to ensure that the test is conducted safely.
- Should the applicant choose to terminate a skill test for reasons considered inadequate by the Examiner, the applicant shall retake the entire skill test. If the test is terminated for reasons considered adequate by the Examiner, only those sections not completed shall be tested in a further flight.
- At the discretion of the Examiner, any manoeuvre or procedure of the test may be repeated once by the applicant. The Examiner may stop the test at any stage if it is considered that the applicant's demonstration of flying skill requires a complete re-test.
- An applicant shall be required to fly the UAS from a position where the pilot-in-command functions can be performed and to carry out the test as if there is no other crewmember. Responsibility for the flight shall be allocated in accordance with national regulations.
- The area and route to be flown shall be chosen by the Examiner and all low level and hover work shall be at an approved aerodrome/site. The applicant shall be responsible for the flight planning and shall ensure that all equipment and documentation for the execution of the flight are available. The total duration of the flight(s) should be at least 60 minutes taking into account the performance of the UAS. The flight may contain multiple take off and landings.
- An applicant shall indicate to the Examiner the checks and duties carried out, including the identification of radio facilities. Checks shall be completed in accordance with the authorised checklist for the UAS on which the test is being taken.
  Performance data shall be calculated by the applicant in compliance with the operations manual or flight manual for the system used.
- The Examiner shall take no part in the operation of the system except where intervention is necessary in the interests of safety or to avoid unacceptable delay to other traffic.

Flight test tolerances

- The applicant shall demonstrate the ability to:
  a) operate the UAS within its limitations;
  b) complete all manoeuvres with smoothness and accuracy;
  c) exercise good judgement and airmanship;
  d) apply aeronautical knowledge;
  e) maintain control of the UAS at all times in such a manner that the successful outcome of a procedure or manoeuvre is never in doubt;
  f) understand and apply crew co-ordination and incapacitation procedures, if applicable; and
  g) communicate effectively with the other crew members, if applicable.
- The Examiner shall make allowance for turbulent conditions and the handling qualities and performance of the UAS used.
- The Examiner shall use the standards as set in the Training Manual by the training organisation as a minimum standard for the applicant's performance.

Content of the test

See Appendix 4.

Appendix 4.

Skill test/Training exercises for UAS, VLOS operations only.

	Manoeuvres/Procedures	Instructor's initials when training completed.	Examiner's initials when test completed.
	SECTION 1 PRE-FLIGHT OPERATIONS AND DEPARTURE		
1.1	Pre-flight documentation and weather briefing.		
1.2	Flight plan and map reading.		
1.3	Take-off and landing site operations, conflict avoidance precautions and procedures preparation.		
1.4	Positioning the Pilot, Ground station related to UA operation and obstacles.		
1.5	Mass and balance and performance calculation.		
1.6	UAS, assemblage, inspection and servicing.		
1.7	Carry out pre-flight checks.		
	SECTION 2 DEPARTURE & TAKE OFF MANOEUVRES AND PROCEDURES[1]		
2.1	Engine starting and after starting procedures		
2.2	Pre Take off procedures		

	Manoeuvres/Procedures	Instructor's initials when training completed.	Examiner's initials when test completed.
2.3	Take-off and after take-off checks		
2.4	Take off and hover tail in over the take off point, with the helicopter skids at eye level, for approximately fifteen seconds. (Rotary UAS only)		
2.5	Take off and complete a left (or right) hand circuit and overfly the take-off area.		
2.6	Normal and crosswind take-off.		
2.7	Maximum performance (short field and obstacle clearance) take-off and landings and recoveries if applicable.		
	SECTION 3 GENERAL AIRWORK[1]		
3.1	Control of the aircraft by external visual reference, including Straight and level flight, climb and descent.		
3.2	Turns, descending and climbing turns.		
3.3	Fly a 'figure of eight' course with the crossover point in front of the pilot, height to be constant. (Rotary UAS only)		
3.4	Stall Recovery Procedures. (Fixed wing UAS only)		
	SECTION 4 EN-ROUTE MANOEUVRES AND PROCEDURES[1]		
4.1	Flightplan and map reading.		
4.2	Flight management (checks; fuel and system).		
4.3	Flight and navigation data interpretation as displayed on the Control Computer.		
4.4	Flight path and inputs by the crew to alter the flight path.		
4.5	Stall Recovery Procedures. (Fixed wing UAS only)		
4.6	Arrival Procedures.		
	SECTION 5 APPROACH CIRCUIT AND LANDING/RECOVERY MANOEUVRES AND PROCEDURES[1]		
5.1	Fly a rectangular circuit and approach with appropriate use of the throttle and perform a landing on the designated landing area.		
5.2	Fly a rectangular landing approach and overshoot from below 10ft. Note: this manoeuvre is an aborted landing, not a low pass.		
5.3	Perform an approach at 45 degree to the vertical, landing within a predetermined two-meter square. (Rotary UAS only)		
5.4	Normal and crosswind landings/recoveries		
5.5	Maximum performance, short field and obstacle clearance landings/ recoveries.		
5.6	Post-flight inspection.		
5.7	Removal of model and equipment.		
	SECTION 6 ABNORMAL AND EMERGENCY MANOEUVRES AND PROCEDURES		
6.1	Simulated Emergencies, including equipment failures.		
6.2	Crew intervention at any time during the flight to manage safe control of the UAS.		
6.3	Avoidance of other traffic.		
6.4	Recovery from unusual attitudes.		
6.5	Command and Control Loss data Link procedures.		
6.6	Simulated asymmetric flight.		

[1] As applicable to the specific UAS.

Appendix 5

Theoretical knowledge – VLOS Licence

An applicant shall have received the relevant theoretical knowledge instruction on a RO or a TO according to the syllabus subjects and headline topics below.

X = required knowledge
G = global knowledge only

Manned Aircraft PPL Learning Objectives:	Applicable VLOS Learning Objectives	BLOS TBD
AIR LAW		
Legislation		
The Convention on International Civil Aviation	X	
The International Civil Aviation Organization	X	

Manned Aircraft PPL Learning Objectives:	Applicable VLOS Learning Objectives	BLOS TBD
Articles of the Convention		
Sovereignty	X	
Territory		
Flight over territory of Contracting States	X	
Landing at customs airports		
Applicability of air regulations		
Rules of the air	X	
Entry and clearance regulations of Contracting States		
Search of aircraft	X	
Facilitation of formalities		
Customs and immigration procedures		
Customs duty		
Documents to be carried in aircraft	X	
Use of aircraft radio equipment	X	
Certificate of airworthiness	X	
Licences of personnel	X	
Recognition of certificates and licences	X	
Journey log books	X	
Payload restrictions	X	
Restrictions on use of photographic equipment	X	
Adoption of international standards and procedures	X	
Endorsement of certificates and licences	X	
Validity of endorsed certificates and licences	X	
Annexes to the Convention ('ICAO Annexes')	X	
Annex 7 Aircraft nationality and registration marks		
definitions	X	
aircraft registration marks	X	
certificate of registration	X	
identification plate	X	
Annex 8 Airworthiness of aircraft		
definitions	X	
certificate of airworthiness	X	
continuing airworthiness	X	
validity of certificate of airworthiness	X	
instruments and equipment	X	
aircraft limitations and information	X	
Rules of the air		
Annex 2 Rules of the air		
definitions	X	
applicability	X	
general rules	X	
visual flight rules	X	
signals (Appendix 1)		
interception of civil aircraft (Appendix 2)		
Air traffic regulations and air traffic services		
Annex 11 Air traffic regulations and air traffic services		
definitions	X	
objectives of air traffic services	X	
classification of airspace	X	
flight information regions, control areas and control zones	X	
air traffic control services	X	
flight information services	X	
alerting service	X	
visual meteorological conditions	X	
instrument meteorological conditions	X	
in-flight contingencies	X	
Annex 14 Aerodrome data		
definitions	X	

Manned Aircraft PPL Learning Objectives:	Applicable VLOS Learning Objectives	BLOS TBD
conditions of the movement area and related facilities	X	
Visual aids for navigation		
indicators and signalling devices		
markings		
lights		
signs		
markers		
signal area		
Visual aids for denoting obstacles	X	
marking of objects	X	
lighting of objects	X	
Visual aids for denoting restricted use of areas		
Emergency and other services	X	
fire and rescue service	X	
apron management service		
Aerodrome ground lights and surface marking colours		
colours for aeronautical ground lights		
colours for surface markings		
5 ICAO Document 4444 Rules of the air and air traffic services		
General provisions		
definitions		
ATS operating practices	G	
flight plan clearance and information		
control of air traffic flow		
altimeter setting procedures		
wake turbulence information		
meteorological information	G	
air reports (AIREP)		
Area control service	G	
separation of controlled traffic in the various classes of airspace	G	
pilots, responsibility to maintain separation in VMC	G	
emergency and communications failure procedures by the pilot		
interception of civil aircraft		
Approach control service		
departing and arriving aircraft procedures in VMC	G	
Aerodrome control service		
function of aerodrome control towers		
VFR operations		
traffic and circuit procedures	G	
information to aircraft	G	
control of aerodrome traffic		
Flight information and alerting service		
air traffic advisory service		
objectives and basic principles		
JARUS regulations		
6 JARUS Regulations		
UAS-FCL Subpart A General requirements	X	
025 Validity of licences and ratings	X	
035 Medical fitness	X	
040 Decrease in medical fitness	X	
050 Crediting of flight time	X	
065 State of Licence issue	X	
UAS-FCL Subpart B Student pilot	X	
085 Requirements	X	
090 Minimum Age	X	
095 Medical fitness	X	
UAS-FCL Subpart C VLOS licence		
100 Minimum Age		

Manned Aircraft PPL Learning Objectives:	Applicable VLOS Learning Objectives	BLOS TBD
105 Medical fitness		
110 Privileges and conditions		
115 Ratings for special purposes		
120 Experience and Crediting		
125 Training course		
130 Theoretical knowledge examination		
135 Skill test		
UAS-FCL Subpart D BLOS N/A		
UAS-FCL Subpart E N/A		
UAS-FCL Subpart F Type and Class Ratings	X	
215 Division of Class Ratings	X	
225 Circumstances in which type or class ratings are required	X	
245 Validity, revalidation and renewal	X	
UAS-FCL Subpart H Instructor ratings	X	
300 Instruction general	X	
UAS GENERAL KNOWLEDGE		
Airframe		
7 Airframe structure	X	
ROTARY TBD		
components	X	
fuselage, wings, tailplane, fin	X	
primary flying controls	X	
trim and flap/slat systems	X	
landing gear		
nose wheel, including steering		
tyres, condition		
braking systems and precautions in use		
retraction systems		
8 Airframe loads	X	
static strength	X	
safety factor	X	
control locks and use		
ground/flight precautions		
Powerplant/Turbine/Electrical		
9 Engines general	X	
principles	X	
basic construction	X	
causes of pre-ignition and detonation		
power output as a function of RPM		
10 Engine cooling	G	
air cooling		
cowling design and cylinder baffles		
design and use of cowl flaps		
cylinder head temperature gauge		
11 Engine lubrication	G	
function and methods of lubrication		
lubrication systems		
methods of oil circulation		
oil pump and filter requirements		
qualities and grades of oil		
oil temperature and pressure control		
oil cooling methods		
recognition of oil system malfunctions		
12 Ignition systems	G	
principles of magneto ignition		
construction and function		
purpose and principle of impulse coupling		
serviceability checks, recognition of malfunctions		

Manned Aircraft PPL Learning Objectives:	Applicable VLOS Learning Objectives	BLOS TBD
operational procedures to avoid spark plug fouling		
13 Carburation	G	
principles of float type carburettor		
construction and function		
methods to maintain correct mixture ratio		
operation of metering jets and accelerator pump		
effect of altitude		
manual mixture control		
maintenance of correct mixture ratio		
limitation on use at high power		
avoidance of detonation		
idle cut-off valve		
operation and use of primary controls		
air induction system		
alternate induction systems		
carburettor icing, use of hot air		
injection systems, principles and operation		
14 Aero engine fuel		
classification of fuels		
grades and identification by colour		
quality requirements		
inspection for contamination		
use of fuel strainers and drains		
15 Fuel systems	G	
fuel tanks and supply lines		
venting system		
mechanical and electrical pumps		
gravity feed		
tank selection		
system management		
16 Propellers	G	
propeller nomenclature		
conversion of engine power to thrust		
design and construction of fixed pitch propeller		
forces acting on propeller blade		
variation of RPM with change of airspeed		
thrust efficiency with change of speed		
design and construction of variable pitch propeller		
constant speed unit operation		
effect of blade pitch changes		
windmilling effect		
17 Engine handling	X	
starting procedures and precautions	X	
recognition of malfunctions		
warming up, power and system checks		
oil temperature and pressure limitations		
cylinder head temperature limitations		
ignition and other system checks		
power limitations		
avoidance of rapid power changes		
use of mixture control		
Systems		
18 Electrical system	G	
installation and operation of alternators/generators		
direct current supply		
batteries, capacity and charging		
voltmeters and ammeters		
circuit breakers and fuses		

Manned Aircraft PPL Learning Objectives:	Applicable VLOS Learning Objectives	BLOS TBD
electrically operated services and instruments		
recognition of malfunctions		
procedure in the event of malfunctions		
19 Vacuum system		
components		
pumps		
regulator and gauge		
filter system		
recognition of malfunction		
procedures in the event of malfunctions		
Instruments		
20 Pitot/static system	G	
pitot tube, function		
pitot tube, principles and construction	X	
static source		
alternate static source		
position error		
system drains		
heating element		
errors caused by blockage or leakage		
21 Airspeed indicator	G	
principles of operation and construction	X	
relationship between pitot and static pressure		
definitions of indicated, calibrated and true airspeed		
instrument errors		
airspeed indications, colour coding		
pilot's serviceability checks		
22 Altimeter	G	
principles of operation and construction	X	
function of the sub-scale	X	
effects of atmospheric density		
pressure altitude		
true altitude		
international standard atmosphere		
flight level		
presentation (three needle)		
instrument errors		
pilot's service ability checks		
23 Vertical speed indicator		
principles of operation and construction		
function		
inherent lag		
instantaneous VSI		
presentation		
pilot's serviceability checks		
24 Gyroscopes	G	
principles	x	
rigidity		
precession		
25 Turn indicator		
rate gyro		
purpose and function		
effect of speed		
presentation		
turn co-ordinator		
limited rate of turn indications		
power source		
balance indicator		

Manned Aircraft PPL Learning Objectives:	Applicable VLOS Learning Objectives	BLOS TBD
principle		
presentation		
pilot's serviceability checks		
26 Attitude indicator	G	
earth gyro		
purpose and function	X	
presentations		
interpretation		
operating limitations		
power source		
pilot's serviceability checks		
27 Heading indicator	G	
directional gyro		
purpose and function	X	
presentation		
use with magnetic compass		
setting mechanism		
apparent drift		
operating limitations		
power source		
pilot's serviceability checks		
28 Magnetic compass	G	
construction and function		
earth's magnetic field		
variation and deviation		
turning, acceleration errors		
precautions when carrying magnetic items		
pilot's service ability checks		
29 Engine instruments	G	
principles, presentation and operational use of:	X	
oil temperature gauge		
oil pressure gauge		
cylinder head temperature gauge		
exhaust gas meter		
manifold pressure gauge		
fuel pressure gauge		
fuel flow gauge		
fuel quantity gauge(s)		
tachometer		
30 Other instruments		
principles, presentation and operational use of:		
vacuum gauge		
voltmeter and ammeter		
warning indicators		
others relevant to UAS type		
Airworthiness		
31 Airworthiness		
certificate to be in force	X	
compliance with requirements	X	
periodic maintenance inspections	X	
compliance with flight manual (or equivalent), instructions, limitations, placards	X	
flight manual supplements	X	
provision and maintenance of documents	X	
aircraft, engine and propeller log books	X	
recording of defects	X	
permitted maintenance by pilots !!	X	
FLIGHT PERFORMANCE AND PLANNING		
Mass and balance		

Manned Aircraft PPL Learning Objectives:	Applicable VLOS Learning Objectives	BLOS TBD
32 Mass and balance	X	
limitations on maximum mass	X	
forward and aft limitations of centre of gravity, normal and utility operation	X	
mass and centre of gravity calculations UAS manual and balance sheet	X	
Performance		
33 Take-off	G	
take-off run and distance available		
take-off and initial climb		
effects of mass, wind and density altitude	X	
effects of ground surface and gradient		
use of flaps		
34 Landing	G	
effects of mass, wind, density altitude and approach speed	X	
use of flaps		
ground surface and gradient		
35 In flight		
relationship between power required and power available		
performance diagram		
maximum rate and maximum angle of climb		
range and endurance	X	
effects of configuration, mass, temperature and altitude		
reduction of performance during climbing turns		
gliding		
adverse effects		
icing, rain		
condition of the airframe		
effect of flap		
HUMAN PERFORMANCE AND LIMITATIONS		
Basic physiology		
36 Concepts		
composition of the atmosphere		
the gas laws		
respiration and blood circulation		
37 Effects of partial pressure		
effect of increasing altitude		
gas transfer		
hypoxia		
symptoms		
prevention		
cabin pressurisation		
effects of rapid decompression		
time of useful consciousness		
the use of oxygen masks and rapid descent		
hyperventilation		
symptoms		
avoidance		
effects of accelerations		
38 Vision	X	
physiology of vision	X	
limitations of the visual system	X	
vision defects	X	
optical illusions new tbd, from gound view	X	
spatial disorientation	X	
avoidance of disorientation	X	
39 Hearing		
physiology of hearing		
inner ear sensations		
effects of altitude change		

Manned Aircraft PPL Learning Objectives:	Applicable VLOS Learning Objectives	BLOS TBD
noise and hearing loss		
protection of hearing	X	
spatial disorientation	X	
conflicts between ears and eyes		
prevention of disorientation	X	
40 Motion sickness		
causes		
symptoms		
prevention		
41 Flying and health	X	
medical requirements	X	
effect of common ailments and cures	X	
colds	X	
stomach upsets	X	
drugs, medicines, and side effects	X	
alcohol	X	
fatigue	X	
personal fitness	X	
scuba diving precautions before flying		
42 Toxic hazards		
dangerous goods		
carbon monoxide from heaters	X	
Basic psychology		
43 The information process	X	
concepts of sensation	X	
cognitive perception	X	
expectancy	X	
anticipation	X	
habits	X	
44 The central decision channel	X	
mental workload, limitations	X	
information sources	X	
stimuli and attention	X	
verbal communication	X	
memory and its limitations	X	
causes of misinterpretation	X	
45 Stress	X	
causes and effects	X	
concepts of arousal	X	
effects on performance	X	
identifying and reducing stress	X	
46 Judgement and decision making	X	
concepts of pilots' judgement	X	
psychological attitudes	X	
behavioural aspects	X	
risk assessment	X	
development of situational awareness	X	
METEOROLOGY		
47 The atmosphere		
composition and structure	G	
vertical divisions		
48 Pressure, density and temperature		
barometric pressure, isobars		
changes of pressure, density and temperature with altitude		
altimetry terminology		
solar and terrestrial energy radiation, temperature		
diurnal variation of temperature		
adiabatic process		

Manned Aircraft PPL Learning Objectives:	Applicable VLOS Learning Objectives	BLOS TBD
temperature lapse rate		
stability and instability		
effects of radiation, advection subsidence and convergence		
49 Humidity and precipitation		
water vapour in the atmosphere		
vapour pressure		
dew point and relative humidity		
condensation and vaporisation		
precipitation		
50 Pressure and wind		
high and low pressure areas		
motion of the atmosphere, pressure gradient		
vertical and horizontal motion, convergence, divergence		
surface and geostrophic wind		
effect of wind gradient and windshear on take-off and landing	X	
relationship between isobars and wind, Buys Ballot's law		
turbulence and gustiness	X	
local winds, föhn, land and sea breezes		
51 Cloud formation	G	
cooling by advection, radiation and adiabatic expansion		
cloud types		
convection clouds		
orographic clouds		
stratiform and cumulus clouds		
flying conditions in each cloud type		
52 Fog, mist and haze	G	
radiation, advection, frontal, freezing fog		
formation and dispersal		
reduction of visibility due to mist, snow, smoke, dust and sand		
assessment of probability of reduced visibility		
hazards in flight due to low visibility, horizontal and vertical		
53 Airmasses		
description of and factors affecting the properties of airmasses		
classification of airmasses, region of origin		
modification of airmasses during their movement		
development of low and high pressure systems		
weather associated with pressure systems		
54 Frontology		
formation of cold and warm fronts		
boundaries between airmasses		
development of a warm front		
associated clouds and weather		
weather in the warm sector		
development of a cold front		
associated clouds and weather		
occlusions		
associated clouds and weather		
stationary fronts		
associated clouds and weather		
55 Ice accretion		
conditions conducive to ice formation	X	
effects of hoar frost, rime ice, clear ice	X	
effects of icing on aircraft performance	X	
precautions and avoidance of icing conditions	X	
powerplant icing	X	
precautions, prevention and clearance of induction and carburettor icing	X	
56 Thunderstorms		
formation airmass, frontal, orographic		

Manned Aircraft PPL Learning Objectives:	Applicable VLOS Learning Objectives	BLOS TBD
conditions required		
development process		
recognition of favourable conditions for formation		
hazards for aircraft	X	
effects of lightning and severe turbulence	X	
avoidance of flight in the vicinity of thunderstorms	X	
57 Flight over mountainous areas	G	
hazards		
influence of terrain on atmospheric processes		
mountain waves, windshear, turbulence, vertical movement, rotor effects, valley winds		
58 Climatology		
general seasonal circulation in the troposphere over Europe		
local seasonal weather and winds		
59 Altimetry		
operational aspects of pressure settings		
pressure altitude, density altitude		
height, altitude, flight level		
ICAO standard atmosphere		
QNH, QFE, standard setting		
transition altitude, layer and level		
60 The meteorological organisation	X	
aerodrome meteorological offices	X	
aeronautical meteorological stations	X	
forecasting service	X	
meteorological services at aerodromes	X	
availability of periodic weather forecasts	X	
61 Weather analysis and forecasting		
weather charts, symbols, signs		
significant weather charts		
prognostic charts for general aviation		
62 Weather information for flight planning	X	
reports and forecasts for departure, en-route, destination and alternate(s)	X	
interpretation of coded information METAR, TAF, GAFOR	X	
availability of ground reports for surface wind, windshear, visibility	X	
63 Meteorological broadcasts for aviation		
VOLMET, ATIS, SIGMET		
NAVIGATION		
64 Form of the earth	G	
axis, poles		
meridians of longitude		
parallels of latitude		
great circles, small circles, rhumb lines		
hemispheres, north/south, east/west		
65 Mapping		
aeronautical maps and charts (topographical)	X	
projections and their properties		
conformality		
equivalence		
scale	X	
great circles and rhumb lines		
66 Conformal orthomorphic projection (ICAO 500,000 chart)		
main properties		
construction		
convergence of meridians		
presentation of meridians, parallels, great circles and rhumb lines		
scale, standard parallels		
depiction of height		
67 Direction		

Manned Aircraft PPL Learning Objectives:	Applicable VLOS Learning Objectives	BLOS TBD
true north		
earth's magnetic field, variation annual change		
magnetic north		
vertical and horizontal components		
isogonals, agonic lines		
68 UAS magnetism		
magnetic influences within the UAS		
compass deviation		
turning, acceleration errors		
avoiding magnetic interference with the compass		
69 Distances		
units		
measurement of distance in relation to map projection		
70 Charts in practical navigation	X	
plotting positions	X	
latitude and longitude	X	
bearing and distance	X	
use of navigation protractor	X	
measurement of tracks and distances	X	
71 Chart reference material/map reading	X	
map analysis	X	
topography	X	
relief	X	
cultural features	X	
permanent features (e.g. line features, spot features, unique or special features)	X	
features subject to change (e.g. water)	X	
preparation	X	
folding the map for use		
methods of map reading		
map orientation		
checkpoint features		
anticipation of checkpoints		
with continuous visual contact		
without continuous visual contact		
when uncertain of position		
aeronautical symbols	X	
aeronautical information	X	
conversion of units	X	
72 Principles of navigation		
IAS, CAS and TAS		
track, true and magnetic		
wind velocity, heading and groundspeed		
triangle of velocities		
calculation of heading and groundspeed		
drift, wind correction angle		
ETA		
dead reckoning, position, fix		
73 The navigation computer		
use of the circular slide rule to determine		
TAS, time and distance		
conversion of units		
fuel required		
pressure, density and true altitude		
time en-route and ETA		
use of the computer to solve triangle of velocities		
application of TAS and wind velocity to track		
determination of heading and ground speed		
drift and wind correction angle		

Manned Aircraft PPL Learning Objectives:	Applicable VLOS Learning Objectives	BLOS TBD
74 Time		
relationship between universal coordinated (standard) (UTC) time and local mean time	X	
(LMT)		
definition of sunrise and sunset times	X	
75 Flight planning	X	
selection of charts	X	
route and aerodrome weather forecasts and reports	X	
assessing the weather situation	X	
plotting the route		
considerations of controlled/regulated airspace, airspace restrictions, danger areas, etc.	X	
use of AIP and NOTAMS	X	
ATC liaison procedures in controlled/regulated airspace		
fuel considerations	X	
en-route safety altitude(s)		
alternate aerodromes		
communications and radio/navaid frequencies		
compilation of flight log	X	
compilation of ATC flight plan		
selection of check points, time and distance marks		
mass and balance calculations	X	
mass and performance calculations	X	
76 Practical navigation		
compass headings, use of deviation card		
organisation of in-flight workload		
departure procedure, log entries, altimeter setting and establishing IAS		
maintenance of heading and altitude		
use of visual observations		
establishing position, checkpoints		
revisions to heading and ETA		
arrival procedures, ATC liaison		
completion of flight log and UAS log entries	X	
Radio navigation		
77 Ground D/F		
application		
principles		
presentation and interpretation		
coverage		
errors and accuracy		
factors affecting range and accuracy		
78 ADF, including associated beacons (NDBs) and use of the RMI		
application		
principles		
presentation and interpretation		
coverage		
errors and accuracy		
factors affecting range and accuracy		
79 VOR/DME		
application		
principles		
presentation and interpretation		
coverage		
errors and accuracy		
factors affecting range and accuracy		
80 GPS	X	
application	X	
principles	X	
presentation and interpretation	X	
coverage	X	

Manned Aircraft PPL Learning Objectives:	Applicable VLOS Learning Objectives	BLOS TBD
errors and accuracy	X	
factors affecting reliability and accuracy	X	
81 Ground radar		
application		
principles		
presentation and interpretation		
coverage		
errors and accuracy		
factors affecting reliability and accuracy		
82 Secondary surveillance radar		
principles (transponders)		
application		
presentation and interpretation		
modes and codes		
OPERATIONAL PROCEDURES		
83 ICAO Annex 6, Part II Operation of aircraft		
foreword		
definitions		
general statement		
flight preparation and in-flight procedures	X	
performance and operating limitations	X	
instruments and equipment		
communications and navigation equipment		
maintenance	X	
flight crew	X	
lights to be displayed		
84 ICAO Annex 12 Search and rescue		
definitions		
alerting phases		
procedures for pilot-in-command (para 5.8 and 5.9)	X	
search and rescue signals (para 5.9 and Appendix A)		
85 ICAO Annex 13 Aircraft accident investigation		
definitions		
national procedures	X	
86 Noise abatement		
general procedures		
application to take-off and landing		
87 Contravention of aviation regulations	X	
offences	X	
penalties	X	
PRINCIPLES OF FLIGHT		
88 The atmosphere		
composition and structure		
ICAO standard atmosphere		
atmospheric pressure		
89 Airflow around a body, sub-sonic		
air resistance and air density		
boundary layer		
friction forces		
laminar and turbulent flow		
Bernoulli's principle venturi effect		
90 Airflow about a two dimensional aerofoil		
airflow around a flat plate		
airflow around a curved plate (aerofoil)		
description of aerofoil cross section		
lift and drag		
Cl and Cd and their relationship to angle of attack		
91 Three dimensional flow about an aerofoil		

Manned Aircraft PPL Learning Objectives:	Applicable VLOS Learning Objectives	BLOS TBD
aerofoil shapes and wing planforms		
induced drag		
downwash angle, vortex drag, ground effect		
aspect ratio		
parasite (profile) drag		
form, skin friction and interference drag		
lift/drag ratio		
92 Distribution of the four forces	X	
balance and couples	X	
lift and mass	X	
thrust and drag	X	
methods of achieving balance	X	
93 Flying controls		
the three planes	X	
pitching about the lateral axis	X	
rolling about the longitudinal axis	X	
yawing about the normal axis	X	
effects of the elevators (stabilators), ailerons and rudder	X	
control in pitch, roll and yaw	X	
cross coupling, roll and yaw		
mass and aerodynamic balance of control surfaces		
94 Trimming controls		
basic trim tab, balance tab and anti-balance tab		
purpose and function	X	
method of operation	X	
95 Flaps and slats	G	
simple, split, slotted and Fowler flaps		
purpose and function	X	
operational use		
slats, leading edge		
purpose and function		
normal/automatic operation		
96 The stall	G	
stalling angle of attack		
disruption of smooth airflow		
reduction of lift, increase of drag		
movement of centre of pressure		
symptoms of development	X	
UAS characteristics at the stall		
factors affecting stall speed and UAS behaviour at the stall	X	
stalling from level, climbing, descending and turning flight		
inherent and artificial stall warnings		
recovery from the stall	X	
97 Avoidance of spins	X	
wing tip stall		
the development of roll		
recognition at the incipient stage		
immediate and positive stall recovery		
98 Stability		
definitions of static and dynamic stability		
longitudinal stability		
centre of gravity effect on control in pitch		
lateral and directional stability		
interrelationship, lateral and directional stability		
99 Load factor and manoeuvres		
structural considerations		
manoeuvring and gust envelope		
limiting load factors, with and without flaps		

Manned Aircraft PPL Learning Objectives:	Applicable VLOS Learning Objectives	BLOS TBD
changes in load factor in turns and pull-ups		
manoeuvring speed limitations		
in-flight precautions		
100 Stress loads on the ground		
side loads on the landing gear		
landing		
Taxiing, precautions during turns		
COMMUNICATIONS	-	
101 Radio telephony and communications	-	
use of AIP and frequency selection		
microphone technique		
phonetic alphabet		
station/UAS callsigns/abbreviations		
transmission technique		
use of standard words and phrases		
listening out		
required 'readback' instructions		
102 Departure procedures		
radio checks		
taxi instructions		
holding on ground		
departure clearance		
103 En-route procedures		
frequency changing		
position, altitude/flight level reporting		
flight information service		
weather information		
weather reporting		
procedures to obtain bearings, headings, position		
procedural phraseology		
height/range coverage		
vertical situational awareness (avoidance of controlled flight into terrain).		
104 Arrival and traffic pattern procedures		
arrival clearance		
calls and ATC instructions during the:		
circuit		
approach and landing		
vacating runway		
105 Communications failure		
Action to be taken		
alternate frequency		
serviceability check, including microphone and headphones		
in-flight procedures according to type of airspace		
106 Distress and urgency procedures		
distress (Mayday), definition and when to use		
frequencies to use		
contents of Mayday message		
urgency (Pan), definition and when to use		
frequencies to use		
relay of messages		
maintenance of silence when distress/urgency calls heard		
cancellation of distress/urgency		
General flight safety		
107 Aircraft		
seat adjustment and security		
harnesses and seat belts		
emergency equipment and its use	X	
fire extinguisher	X	

Manned Aircraft PPL Learning Objectives:	Applicable VLOS Learning Objectives	BLOS TBD
engine/cabin fires	X	
de-icing systems		
survival equipment, life jackets, life rafts		
carbon monoxide poisoning	X	
refuelling precautions	X	
flammable goods/pressurised containers		
108 Operational		
wake turbulence		
aquaplaning		
windshear, take-off, approach and landing		
clearance to cross or enter runway (avoidance of runway incursions)		
emergency exits		
evacuation from the UAS		
forced landings		
gear-up landing		
ditching		
ROTORSYSTEM		
Component of rotorsystem	X	
Specific rotor adjustment criteria	X	
TBD		
PAYLOAD	X	
Securing of Payload	X	
Payload connection to electric system	X	
(1) Payload interface with command control station	X	
DATA LINK		
Frequenties of DT	X	
Property of DT frequenties	X	
Relation transmitting power and range	X	
Influence of obstable to transmitting range	X	
DL capacity factors.	X	
Influence of other transmitters (jamming stations)	X	
Specific function and restrictions/limitations of Data protocols and error correction	X	
Electro-Magnetic Compatibility and Interference	X	

TOELICHTING

Kort gesteld verzoekt Ampyx Power B.V. niet alleen om het opnieuw instellen van het BVG Kraggenburg, maar ook om een ontheffing voor lichte onbemande luchtvaartuigen (hierna te noemen: UAS), Klasse 1, voor beroepsmatig uit te voeren testvluchten binnen dit BVG.

Het verzoek voor het opnieuw instellen van het BVG Kraggenburg is tevens opgevat als een verzoek tot ontheffing van het verbod om een vlucht uit te voeren met een luchtvaartuig:
- Zonder geldig **bewijs van luchtwaardigheid en bewijs van inschrijving,** en
- Zonder het hebben van een geldig **bewijs van bevoegdheid** voor de operators van de PowerPlane,
  - R. Ruiterkamp-Beneder (geboren 18 september 1972 te Utrecht).
  - S. Sierberling (geboren 8 mei 1983).

Door Ampyx Power B.V. is aangegeven dat de operators beschikken over vaardigheden om een model(zweef)vliegtuig te besturen.

Ingevolge artikel 1a, onderdeel c, van het Luchtverkeersreglement, zijn de titels 5.1 en 5.2 van de Wet luchtvaart en dit besluit (het Luchtverkeersreglement), met uitzondering van het tweede en derde lid en de artikelen 20 en 63, niet van toepassing op de volgende luchtvaartuigen:
(.../...)
licht onbemand luchtvaartuig, niet zijnde een modelluchtvaartuig (< 25 kg) of onbemande vrije ballon, zijnde een luchtvaartuig waarvan de totale startmassa niet meer dan 150 kilogram bedraagt en de maximale snelheid lager is dan 129,64 km/u (70 knopen);

Ingevolge artikel 2.1, eerste lid, van de Wet luchtvaart is het verboden een luchtvaartuig te bedienen zonder het daarvoor geldige bewijs van bevoegdheid of geldige bewijs van gelijkstelling.
Ingevolge artikel 2.1, vierde lid, van de Wet luchtvaart kan de Minister van Verkeer en Waterstaat ontheffing verlenen van het bepaalde bij of krachtens dit artikel. (.../...)
Aan de ontheffing kunnen voorschriften of beperkingen worden verbonden.

Ingevolge artikel 5.3 van de Wet luchtvaart is het verboden op zodanige wijze aan het luchtverkeer deel te nemen dan wel luchtverkeersleiding te geven dat daardoor personen of zaken in gevaar worden of kunnen worden gebracht.

Het onbemande zweefvliegtuig *PowerPlane Experimental* is een licht onbemand luchtvaartuig, als bedoeld in artikel 1a, eerste lid, onder c, van het Luchtverkeersreglement.

Ingevolge artikel 20, tweede lid, onder e, van het Luchtverkeersreglement verlenen luchtvaartuigen, bedoeld in artikel 1a, (.../...) voorrang aan vliegtuigen, helikopters, vrije ballonnen, (zweeftoestellen) en luchtschepen.
Uit artikel 35, derde lid, van de Regeling veilig gebruik luchthavens en andere terreinen volgt:
(.../...)
De houder van de ontheffing (van de Provincie) meldt ten minste 24 uur voor de dag dat het terrein zal worden gebruikt dit voornemen schriftelijk of per e-mail aan de minister en de burgemeester van de gemeente waarin het betreffende terrein ligt.

Volgens artikel 3.8 Wet luchtvaart is het verboden een vlucht uit te voeren met een luchtvaartuig dat niet luchtwaardig is of niet is voorzien van een geldig bewijs van luchtwaardigheid.
Artikel 3.21 van de Wet luchtvaart geeft de minister de mogelijkheid om op aanvraag van de houder (van een luchtvaartuig) ontheffing verlenen van de bij of krachtens paragraaf 3.2.1 gestelde regels, wanneer door bijzondere omstandigheden die regels in redelijkheid geen toepassing kunnen vinden en de veiligheid van het luchtverkeer met het verlenen van de ontheffing niet in gevaar wordt gebracht. Aan de ontheffing kunnen voorschriften of beperkingen worden verbonden. Een dergelijke ontheffing wordt ingetrokken wanneer de redenen waarom de ontheffing is verleend zijn komen te vervallen, of de houder van de ontheffing de daaraan verbonden voorschriften of beperkingen niet naleeft.

Het innovatieve karakter van de vluchtuitvoering van Ampyx PowerPlane en het ontbreken van specifieke voorschriften in de huidige wet- en regelgeving voor UAS aangaande bewijzen van bevoegdheid en luchtwaardigheid, vluchtuitvoering en gebruik van het luchtruim, maken dat de Inspectie Verkeer en Waterstaat (hierna te noemen: de inspectie) van oordeel is dat maatwerk noodzakelijk is om testvluchten met de PowerPlane Experimental mogelijk te maken.

Op 2 mei 2011 is de beoordeling van uw risicoanalyse afgerond door de inspectie.

De inspectie beoordeelt, op basis van het bovenstaande, de risicoanalyse als voldoende om testvluchten met de **PowerPlane Experimental** te kunnen uitvoeren op een dusdanige wijze dat het luchtverkeer niet in gevaar wordt gebracht.