Tasneef®
Life Environmentally Optimized

Rules for the Certification of Remotely Piloted Vessels

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GENERAL CONDITIONS

Definitions:

"*Administration*" means the Government of the State whose flag the Ship is entitled to fly or under whose authority the Ship is authorised to operate in the specific case.

"IACS" means the International Association of Classification Societies.

"*Interested Party*" means the party, other than the Society, having an interest in or responsibility for the Ship, product, plant or system subject to classification or certification (such as the owner of the Ship and his representatives, the ship builder, the engine builder or the supplier of parts to be tested) who requests the Services or on whose behalf the Services are requested.

"*Owner*" means the registered owner, the ship owner, the manager or any other party with the responsibility, legally or contractually, to keep the ship seaworthy or in service, having particular regard to the provisions relating to the maintenance of class laid down in Part A, Chapter 2 of the Rules for the Classification of Ships or in the corresponding rules indicated in the specific Rules.

"Rules" in these General Conditions means the documents below issued by the Society:

(i) Rules for the Classification of Ships or other special units;
(ii) Complementary Rules containing the requirements for product, plant, system and other certification or containing the requirements for the assignment of additional class notations;
(iii) Rules for the application of statutory rules, containing the rules to perform the duties delegated by Administrations;
(iv) Guides to carry out particular activities connected with Services;
(v) Any other technical document, as for example rule variations or interpretations.

"*Services*" means the activities described in Article 1 below, rendered by the Society upon request made by or on behalf of the Interested Party.

"Ship" means ships, boats, craft and other special units, as for example offshore structures, floating units and underwater craft.

"*Society*" or *"TASNEEF"* means Tasneef and/or all the companies in the Tasneef Group which provide the Services.

"*Surveyor*" means technical staff acting on behalf of the Society in performing the Services.

Article 1

1.1. The purpose of the Society is, among others, the classification and certification of ships and the certification of their parts and components. In particular, the Society:
(i) sets forth and develops Rules;
(ii) publishes the Register of Ships;
(iii) issues certificates, statements and reports based on its survey activities.

1.2. The Society also takes part in the implementation of national and international rules and standards as delegated by various G overnments.

1.3. The Society carries out technical assistance activities on request and provides special services outside the scope of classification, which are regulated by these general conditions, unless expressly excluded in the particular contract.

Article 2

2.1. The Rules developed by the Society reflect the level of its technical knowledge at the time they are published. Therefore, the Society, although committed also through its research and development services to continuous updating of the Rules, does not guarantee the Rules meet state-of-the-art science and technology at the time of publication or that they meet the Society's or others' subsequent technical developments.

2.2. The Interested Party is required to know the Rules on the basis of which the Services are provided. With particular reference to Classification Services, special attention is to be given to the Rules concerning class suspension, withdrawal and reinstatemen t. In case of doubt or inaccuracy, the Interested Party is to promptly contact the Society for clarification.
The Rules for Classification of Ships are published on the Society's website: www.tasneef.ae.

2.3. The Society exercises due care and skill:
(i) in the selection of its Surveyors
(ii) in the performance of its Services, taking into account the level of its technical knowledge at the time the Services are performed.

2.4. Surveys conducted by the Society include, but are not limited to, visual inspection and non-destructive testing. Unless otherwise required, surveys are conducted through sampling techniques and do not consist of comprehensive verification or monitoring of the Ship or of the items subject to certification. The surveys and checks made by the Society on board ship do not necessarily require the constant and continuous presence of the Surveyor. The Society may also commission laboratory testing, underwater inspection and other checks carried out by and under the responsibility of qualified service suppliers. Survey practices and procedures are selected by the Society based on its experience and knowledge and according to generally accepted technical standards in the sector.

Article 3

3.1. The class assigned to a Ship, like the reports, statements, certificates or any other document or information issued by the Society, reflects the opinion of the Society concerning compliance, at the time the Service is provided, of the Ship or product subject to certification, with the applicable Rules (given the intended use and within the relevant time frame).
The Society is under no obligation to make statements or provide information about elements or facts which are not part of th e specific scope of the Service requested by the Interested Party or on its behalf.

3.2. No report, statement, notation on a plan, review, Certificate of Classification, document or information issued or given as p art of the Services provided by the Society shall have any legal effect or implication other than a representation that, on the basis of the checks made by the Society, the Ship, structure, materials, equipment, machinery or any other item covered by such document or information meet the Rules. Any such document is issued solely for the use of the Society, its committees and clients or other duly authorised bodies and for no other purpose. Therefore, the Society cannot be held liable for any act made or document issued by other parties on the basis of the statements or information given by the Society. The validity, application, meaning and interpretation of a Certificate of Classification, or any other document or information issued by the Society in connection with its Services, is governed by the Rules of the Society, which is the sole subject entitled to make such interpretation. Any disagreement on technical matters between the Interested Party and the Surveyor in the carrying out of his functions shall be raised in writing as soon as possible with the Society, which will settle any divergence of opinion or dispute.

3.3. The classification of a Ship, or the issuance of a certificate or other document connected with classification or certificati on and in general with the performance of Services by the Society shall have the validity conferred upon it by the Rules of the Society at the time of the assignment of class or issuance of the certificate; in no case shall it amount to a statement or warranty of seaw orthiness,

structural integrity, quality or fitness for a particular purpose or service of any Ship, structur e, material, equipment or machinery inspected or tested by the Society.

3.4. Any document issued by the Society in relation to its activities reflects the condition of the Ship or the subject of certifi cation or other activity at the time of the check.

3.5. The Rules, surveys and activities performed by the Society, reports, certificates and other documents issued by the Society are in no way intended to replace the duties and responsibilities of other parties such as Governments, designers, ship builders, manufacturers, repairers, suppliers, contractors or sub-contractors, Owners, operators, charterers, underwriters, sellers or intended buyers of a Ship or other product or system surveyed.

These documents and activities do not relieve such parties from any fulfilment, warranty, responsibility, duty or obligation (also of a contractual nature) expressed or implied or in any case incumbent on them, nor do they confer on such parties any right, claim or cause of action against the Society. With particular regard to the duties of the ship Owner, the Services undertaken by the Society do not relieve the Owner of his duty to ensure proper maintenance of the Ship and ensure seaworthiness at all times. Likewise, t he Rules, surveys performed, reports, certificates and other documents issued by the Society are intended neither to guarantee the buyers of the Ship, its components or any other surveyed or certified item, nor to relieve the seller of the duties arising out of the law or the contract, regarding the quality, commercial value or characteristics of the item which is the subject of transaction.

In no case, therefore, shall the Society assume the obligations incumbent upon the above-mentioned parties, even when it is consulted in connection with matters not covered by its Rules or other documents.

In consideration of the above, the Interested Party undertakes to relieve and hold harmless the Society from any third party claim, as well as from any liability in relation to the latter concerning the Services rendered.

Insofar as they are not expressly provided for in these General Conditions, the duties and responsibilities of the Owner and Interested Parties with respect to the services rendered by the Society are described in the Rules applicable to the specific Service rendered.

Article 4

4.1. Any request for the Society's Services shall be submitted in writing and signed by or on behalf of the Interested Party. Such a request will be considered irrevocable as soon as received by the Society and shall entail acceptance by the applicant of all relevant requirements of the Rules, including these General Conditions. Upon acceptance of the written request by the Society, a contract between the Society and the Interested Party is entered into, which is regulated by the present General Conditions.

4.2. In consideration of the Services rendered by the Society, the Interested Party and the person requesting the service shall be jointly liable for the payment of the relevant fees, even if the service is not concluded for any cause not pertaining to the Society. In the latter case, the Society shall not be held liable for non-fulfilment or partial fulfilment of the Services requested. In the event of late payment, interest at the legal current rate increased by 1.5% may be demanded.

4.3. The contract for the classification of a Ship or for other Services may be terminated and any certificates revoked at the request of one of the parties, subject to at least 30 days' notice to be given in writing. Failure to pay, even in part, the fees due for Services carried out by the Society will entitle the Society to immediately terminate the contract and suspend the Services.

For every termination of the contract, the fees for the activities performed until the time of the termination shall be owed to the Society as well as the expenses incurred in view of activities already programmed; this is without prejudice to the right to compensation due to the Society as a consequence of the termination.

With particular reference to Ship classification and certification, unless decided otherwise by the Society, termination of the contract implies that the assignment of class to a Ship is withheld or, if already assigned, that it is suspended or withdrawn; any st atutory certificates issued by the Society will be withdrawn in those cases where provided for by agreements between the Society and the flag State.

Article 5

5.1. In providing the Services, as well as other correlated information or advice, the Society, its Surveyors, servants or agents operate with due diligence for the proper execution of the activity. However, considering the nature of the activities performed (see art. 2.4), it is not possible to guarantee absolute accuracy, correctness and completeness of any information or advice supplied. Express and implied warranties are specifically disclaimed.

Therefore, except as provided for in paragraph 5.2 below, and also in the case of activities carried out by delegation of Governments, neither the Society nor any of its Surveyors will be liable for any loss, damage or expense of whatever nature sustained by any person, in tort or in contract, derived from carrying out the Services.

5.2. Notwithstanding the provisions in paragraph 5.1 above, should any user of the Society's Services prove that he has suffered a loss or damage due to any negligent act or omission of the Society, its Surveyors, servants or agents, then the Society will pay compensation to such person for his proved loss, up to, but not exceeding, five times the amount of the fees charged for the specific services, information or opinions from which the loss or damage derives or, if no fee has been charged, a maximum of AED5,000 (Arab Emirates Dirhams Five Thousand only). Where the fees charged are related to a number of Services, the amount of the fees will be apportioned for the purpose of the calculation of the maximum compensation, by reference to the estimated time involved in the performance of the Service from which the damage or loss derives. Any liability for indirect or consequential loss, damage or expense is specifically excluded. In any case, irrespective of the amount of the fees charged, the maximum damages payable by the Society will not be more than AED5,000,000 (Arab Emirates Dirhams Five Millions only). Payment of compensation under this paragraph will not entail any admission of responsibility and/or liability by the Society and will be made without prejudice to the disclaimer clause contained in paragraph 5.1 above.

5.3. Any claim for loss or damage of whatever nature by virtue of the provisions set forth herein shall be made to the Society in writing, within the shorter of the following periods: (i) THREE (3) MONTHS from the date on which the Services were performed, or (ii) THREE (3) MONTHS from the date on which the damage was discovered. Failure to comply with the above deadline will constitute an absolute bar to the pursuit of such a claim against the Society.

Article 6

6.1. These General Conditions shall be governed by and construed in accordance with United Arab Emirates (UAE) law, and any dispute arising from or in connection with the Rules or with the Services of the Society, including any issues concerning responsibility, liability or limitations of liability of the Society, shall be determined in accordance with UAE law. The courts of the Dubai International Financial Centre (DIFC) shall have exclusive jurisdiction in relation to any claim or dispute which may arise out of or in connection with the Rules or with the Services of the Society.

6.2. However,

(i) In cases where neither the claim nor any counterclaim exceeds the sum of AED300,000 (Arab Emirates Dirhams Three Hundred Thousand) the dispute shall be referred to the jurisdiction of the DIFC Small Claims Tribunal; and

(ii) for disputes concerning non-payment of the fees and/or expenses due to the Society for services, the Society shall have the

right to submit any claim to the jurisdiction of the Courts of the place where the registered or operating office of the Interested Party or of the applicant who requested the Service is located.

In the case of actions taken against the Society by a third party before a public Court, the Society shall also have the right to summon the Interested Party or the subject who requested the Service before that Court, in order to be relieved and held harmless according to art. 3.5 above.

Article 7

7.1. All plans, specifications, documents and information provided by, issued by, or made known to the Society, in connection with the performance of its Services, will be treated as confidential and will not be made available to any other party other than the Owner without authorisation of the Interested Party, except as provided for or required by any applicable international, European or domestic legislation, Charter or other IACS resolutions, or order from a competent authority. Information about the status and validity of class and statutory certificates, including transfers, changes, suspensions, withdrawals of class, recommendations/conditions of class, operating conditions or restrictions issued against classed ships and other related information, as may be required, may be published on the website or released by other means, without the prior consent of the Interested Party.

Information about the status and validity of other certificates and statements may also be published on the website or released by other means, without the prior consent of the Interested Party.

7.2. Notwithstanding the general duty of confidentiality owed by the Society to its clients in clause 7.1 above, the Society's clients hereby accept that the Society may participate in the IACS Early Warning System which requires each Classification Society to provide other involved Classification Societies with relevant technical information on serious hull structural and engineering systems failures, as defined in the IACS Early Warning System (but not including any drawings relating to the ship which may be the specific property of another party), to enable such useful information to be shared and used to facilitate the proper working of the IACS Early Warning System. The Society will provide its clients with written details of such information sent to the involved Classification Societies.

7.3. In the event of transfer of class, addition of a second class or withdrawal from a double/dual class, the Interested Party undertakes to provide or to permit the Society to provide the other Classification Society with all building plans and drawings, certificates, documents and information relevant to the classed unit, including its history file, as the other Classification Society may require for the purpose of classification in compliance with the applicable legislation and relative IACS Procedure. It is the Owner's duty to ensure that, whenever required, the consent of the builder is obtained with regard to the provision of plans and drawings to the new Society, either by way of appropriate stipulation in the building contract or by other agreement.

In the event that the ownership of the ship, product or system subject to certification is transferred to a new subject, the latter shall have the right to access all pertinent drawings, specifications, documents or information issued by the Society or which has come to the knowledge of the Society while carrying out its Services, even if related to a period prior to transfer of ownership.

Article 8

8.1. Should any part of these General Conditions be declared invalid, this will not affect the validity of the remaining provisions.

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1 GENERAL PRINCIPLE AND FIELD OF APPLICATION

1.1 Purpose of the Rules

1.1.1 These Rules apply to remotely piloted vessels intended for research activities, specialized operations or experimental activities**.**

1.1.2 A Certificate of Compliance is issued to **remotely piloted vessels** complying with these Rules**.**

The Certificate of Compliance is to be intended as valid for a single unit and the reference identifying the vessel is to be indicated in the Certificate.

1.1.3 Remotely piloted vessels are to comply with the specific requirements of Parts B to D of the Tasneef Rules for the Classification of Ships, as far as practicable and applicable, and are to be provided with special equipment and arrangements suitable for scientific or technological research.
The above-mentioned equipment and/ or arrangements are listed in the Certificate of Compliance issued.

1.1.4 These Rules are applicable to manually operated **remotely piloted vessels**. To mainly and normally automatically **remotely operated vessels** these Rules may be applied on a case by case basis.

1.1.5 These Rules are applicable to **remotely piloted vessels** as defined below, sailing in specified geographical areas where an Authority issues the Seaworthiness Certificates and defines the area of operation and the distances from the congested areas. These Rules are not intended for Ship models as defined below.

1.1.6 These Rules are applicable and are intended to be used for **remotely piloted vessels** with a pilot always present and responsible for navigation control. Some operations may be set to be done automatically but the pilot is to be capable every time of taking control of the **remotely piloted vessel,** overriding the automatic set-up.

1.2 Field of application

1.2.1 These Rules are applicable to **remotely piloted vessels** up to 10 meters in length (Loa) and with a speed up to 4 knots, operating on lakes and similar inland waters or at sea only in sheltered areas, used for research purposes and provided with a system for remote operation and control.
Under normal conditions, personnel are not foreseen on board this type of vessel, either for the control/command of the vessel, or for the operation of the apparatus necessary for research operations.

1.2.2 These Rules are intended for motor vessels with electrical propulsion supplied by batteries (i.e. fed from a shore connection or by photovoltaic panels).

1.3 Limitations

Specific limitations (such as good weather conditions, daily operation, limited distance from shore, maximum wave height) may be given to the vessel taking into consideration the specific characteristics of each vessel.
The operations close to ports or other congested areas are to be conducted in VLOS.
Remotely piloted vessels normally are not intended for dangerous goods transportation. Special considerations may be made on a case by case basis considering the nature and quantity of the dangerous goods and the area of operation.

1.4 Definitions

1.4.1 A **vessel** is to mean any machine designed for the transportation by water of persons or property.

1.4.2 Remotely piloted vessel is a vessel remotely piloted without persons on board, non-submergible, used or intended to be used for specialized operations or experimental activities, not used for recreation and sports and not carrying cargo. It also includes the related components necessary for the control and command by a remote pilot.

1.4.3 A **Ship model** is a remotely operated device without people on board used exclusively for recreational or sport purposes that does not install equipment enabling autonomous navigation and used under the direct and continuous visual control of the model ship pilot without visual aids.
Ship models remotely operated, used for recreational and sports activities, are not to be regarded as vessels for the applicability of these Rules.

1.4.4 Specialized Operations: For the purpose of these Rules, it means those activities involving or carrying out, with a **remotely piloted vessel**, a service, whether remunerated or not, such as surveillance of land or installations, environmental monitoring, agricultural use, photogrammetric activities, etc.

1.4.5 Remotely piloted vessel Observer: a person designated by the operator to assist the pilot, also by visual observation of the **remotely piloted vessel**..

1.4.6 Operator: the person, designated as responsible for the use of the vessel and its maintenance.

1.4.7 Remote pilot: the person, designated by the operator for the conduct of the vessel, who operates the controls, as appropriate, of a **remotely piloted vessel.**

1.4.8 Visual Line of Sight (VLOS): indicates that the operations are carried out under conditions in which the remote pilot remains in direct visual contact with the vessel, without the aid of optical and/or electronic devices, to manage and comply with the rules applicable to the geographic area concerned. The condition of VLOS depends on the weather conditions, visibility conditions, the dimensions, shape, color and use of lights of the **remotely piloted vessel**.

1.4.9 Safe Condition: Normally the safe condition is a situation where the propulsion engines of the **remotely piloted vessel** are shut down and it is at anchor, when the water depth allows such an operation.
When the **remotely piloted vessel** operates in an area where to drop anchor is not possible due to the depth of the water, the **remotely piloted vessel** is to have systems to keep its position.
Safe conditions, different from the above, are to be agreed with Tasneef.

1.4.10 Sail Fence Zone: A "Sail Fence Zone" (SFZ) is a virtual perimeter created on a **remotely piloted vessel** map interface over a real-world geographic area within which navigation is permitted. SFZ can be defined as a list of GPS points forming a polygonal structure fencing the area.

1.4.11 Sheltered area: Sheltered waters such as harbors, estuaries, roadsteads, bays, lagoons and generally calm stretches of waters where the wind force does not exceed 6 Beaufort Scale.

1.4.12 Ground Control Station (GCS): is a land- or sea-based control center that provides the facilities for human control of unmanned vehicles.

1.5 Documentation to be submitted

1.5.1 The following documentation is to be submitted for approval (except where otherwise indicated):

- Midship, transversal, longitudinal sections of the hull and of superstructures and top view of the deck
- Watertight divisions of the hull
- Rudder
- Shaft bracket
- Shaftline
- Weathertight arrangement of the superstructure/deckhouse
- Scheme of the systems foreseen on board (if any)
- Steering system
- Ventilation system
- Fixed fire-extinguishing system and fire detection system in the superstructure/deckhouse
- Mobile fire-fighting equipment
- Electrical installations (main and emergency)
- Equipment number
- Navigation lights
- Indication of **remotely piloted vessel** (signs reported on the **remotely piloted vessel** show other vessels its type of operation)
- Visibility from the remote control position
- General arrangement (for information only)
- Capacity Plan (if applicable, for information only)
- Stability data (inclining test and booklet).

1.6 Required tests on hull materials and machinery

1.6.1 As a general rule, the tests on the hull for the Maltese cross reported in the Tasneef Rules for the Classification of Ships are applicable also to **remotely piloted vessels**, as appropriate. For the machinery, the relevant Work's Certificates issued by the Manufacturer are applicable.

1.7 Certification of the Equipment

1.7.1 As a general rule, the equipment fitted on **remotely piloted vessels** is to be type approved by Tasneef or provided with a certificate in accordance with other national or international standards recognized by Tasneef.

1.8 Pollution prevention

1.8.1 The vessel is to comply with the Environmental rules applicable to vessels operating in its area of operation.

1.9 Surveys for the issue and maintenance of the Certificate of Compliance

1.9.1 The surveys are to be carried out according to the schedule foreseen in Part A, Ch 2 of the Tasneef Rules for the Classification of Ships. As far as the scope of the surveys is concerned, reference is to be made, as far as practicable and applicable, to Part A, Ch 3 and Ch 4 of the Tasneef Rules for the Classification of Ships.

1.9.2 The equipment dedicated to the remote operation of the **remotely piloted vessel** is to be subject to visual inspection and the electric and electronic verifications deemed necessary by the

attending Surveyor are to be carried out at every annual survey. Their proper functioning is also to be checked every year.

2 HULL AND STABILITY

2.1 Hull

2.1.1 Hull strength

The hull strength is to be verified in accordance with ISO 12215 or the Tasneef Rules for the Classification of Ships made in composite material, aluminum or wood, as applicable.

2.1.2 Arrangement of the hull

All the equipment necessary for research purposes or for the remote control of the **remotely piloted vessel** is to be located above the deck in the part of the vessel not included in the stability buoyancy.
The hull is not to be accessible and is to be fully watertight with no openings. Only small holes for drainage where necessary are acceptable if secured watertight.
The research apparatus is to be located inside the deckhouse/superstructure as high as possible above the deck/platform.

2.1.3 Coaming height

The doors of the deckhouse/superstructure are to foresee a sill of at least 75mm. They are to be permanently closed and weathertight.

2.1.4 Equipment number

The following equipment is to be foreseen on board:

- Anchors: at least 1 anchor of 10 kg if high holding power or 20 kg if normal type,
- Chain: diameter of the chain stud less 8 mm 34 kN ultimate strength 30m. If the anchor is high holding power, the steel grade is to be at least Q2. Natural or synthetic fiber cables may be used if the ultimate strength is granted.
- Mooring line: suitable mooring lines are to be provided.
- Suitable handle for pilots that have to access the vessel in emergency situations are to be provided. The strength of such handles is to be in accordance with ISO 15085.

2.1.5 Windows and portlights

No windows or portlights are allowed.

2.1.6 Freeing ports

The deck/platform is to be constructed so as to drain any water that may come onto it.

2.1.7 Hull outfitting

The rudder and propeller shaft strut, if fitted, are to be in accordance with the Tasneef Rules for the Classification of Pleasure Yachts.
A part of the deck /platform may be used as a helideck for remote propelled air vehicles.

2.1.8 Towing strong points

Towing strong points to tow the **remotely piloted vessel** where necessary are to be foreseen and they are to be in accordance with ISO 15084.

2.2 Stability

2.2.1 The stability may be assessed using ISO 12217 -1 for motor vessels over 6 meters in length or ISO 12217-3 for motor vessels of less than 6 meters. If no other limitations on the wind scale or the sea state are imposed, the category used for the assessment of the stability is the one reported on the Certificate of Compliance issued by Tasneef to the **remotely piloted vessel**.

2.2.2 The **remotely piloted vessel** is to be designed to satisfy the ultimate survivability principle: this means that minor damage to the hull is not to cause the immersion of the deck/platform. For this purpose, the hull participating in the buoyancy is to be subdivided within watertight divisions.

2.2.3 The minimum stability and freeboard are to take into consideration the presence of one person with the tools necessary for maintenance on board (assumed 100 kg).
Freeboard means the distance between the waterline and the upper edge of the deck/platform.

3 MACHINERY AND ELECTRICAL INSTALLATION, REQUIREMENT FOR REMOTE CONTROL AND FIRE PROTECTION

3.1 Machinery and Electrical Installation

3.1.1 Propulsion

On **remotely piloted vessels** only electric propulsion supplied by batteries (i.e. charged on shore or by photovoltaic panels) may be acceptable.
The propulsion engines may be located close to the propeller/s. The propulsion engines are to be at least two, fully independent. For **remotely piloted vessels** operating at sea with one engine out of operation it is to be possible to pilot the vessel to the shore with reduced speed. For **remotely piloted vessels** not operating at sea, if it is not possible to pilot the vessel to the shore with one engine out of operation, the **remotely piloted vessel** is allowed to sail only on waters of limited depth so that the **remotely piloted vessel** can be set in the Safe Condition with the anchor securely fastened to the sea/lake bottom.

An emergency shut off of the engines and all the equipment is to be foreseen on board in a suitable, easily accessible position close to the entrance to the superstructure/deckhouse.

3.1.2 Emergency source for electrical power

The emergency source for electrical power is to supply essential equipment (i.e. navigating lights). For **remotely piloted vessels,** steering and propulsion need not be considered as essential systems.

3.1.3 Capacity of the batteries

The capacity of the batteries is to be suitable for a typical research mission and way back to the harbor considering propulsion and research activities as defined in the service notation.
As concerns operation in inclined position, para 2.4 of Pt C, Ch 1, Sec 1 of the Tasneef Rules for the Classification of Inland Waterway Ships and for conformity to Directive 2006/87/EC is applicable. As concerns the test of the machinery, Pt C, Ch 1, Sec 1, [4] of the Tasneef Rules for the Classification of Inland Waterway Ships and for conformity to Directive 2006/87/EC is applicable.
The status of the batteries and the residual capacity (i.e. residual hours of service) of the **remotely piloted vessel** is to be shown in the Ground Control Station where the remote control is performed. An alarm of the approaching discharge of the batteries is to be given to the pilot.

3.1.4 Electrical Installation

The electrical systems are to be in accordance with Part C, Ch 2 and 3 of the Tasneef Rules for the Classification of Ships, as far as practicable.

3.1.5 Pressure vessels

If pressure vessels are foreseen on board they are to comply with Pt C, Ch 1, Sec 3 of the Tasneef Rules for the Classification of Ships.

3.1.6 Shaft Lines

Shafting lines for vessels not operating at sea are to comply with Pt C, Ch 1, Sec 5 of the Tasneef Rules for the Classification of Inland Waterway Ships and for conformity to Directive 2006/87/EC. For vessels operating at sea, the shaft line is to be in compliance with Pt C, Ch 1, Sec 7 of the Tasneef Rules for the Classification of Ships.

3.1.7 Propellers

Propellers for vessels not operating at sea are to comply with Pt C, Ch 1, Sec 6 of the Tasneef Rules for the Classification of Inland Waterway Ships and for conformity to Directive 2006/87/EC. For propellers with diameters of less than 300 mm, the use of non-metallic material may be taken into consideration.
For vessels operating at sea, the propellers are to be in compliance with Pt C, Ch 1, Sec 8 of the Tasneef Rules for the Classification of Ships.

3.1.8 Maneuverability

The navigability and maneuverability are to be tested by means of navigation tests.
The test is to be carried out on the lake where the **remotely piloted vessel** is intended to sail.
It is to be possible to know the depth of the water, width and current in the area of navigation. Tests are to be carried out at different water levels.
For the test of turning into the current the anchor may be used, in the other tests the anchor cannot be used.
As concerns the stopping capacity, the vessel is to be able to stop facing downstream in good time while remaining adequately maneuverable.
The vessel is to be able to sail astern against the current. Pt C, Ch 1, Sec 1, [2.7] of the Tasneef Rules for the Classification of Inland Waterway Ships and for conformity to Directive 2006/87/EC is also applicable. The vessel is to be able to take evasive action in reasonable time.
The vessel is to be able to turn in a reasonable time.

3.1.9 Steering

Steering is to permit the maneuverability required by these Rules.
Powered steering systems are to be so designed that the mechanism intended for steering can't change position unintentionally.
The steering system is to be designed for temperatures at which the vessel is intended to be used.
The system is to be arranged and designed to avoid the spread of water-polluting lubricants.
Power operated steering apparatus is to be duplicated so that a single failure will not cause the loss of steering capability. The second steering apparatus is to be available immediately in the case of a single failure of the main steering system and it is to permit the same maneuverability as the main steering system.
The steering systems may be hydraulic or electric.
The rudder may be replaced by a system capable of steering the vessel using different speeds and sense of rotation of the propellers.
Where steering and propulsion are integrated in the same system, a single failure is not to put one of the two services out of order. See [3.1.1].

3.2 Requirements for remote control

3.2.1 Controls of propulsion engine, systems for stopping and research systems

At least 3 controls are to be provided. One of which is to be located inside the vessel, physically connected to the equipment.
A failure of the remote control is not to make the **remotely piloted vessel** exit the Sail Fence Zone.

It is not possible to place waypoints outside the Sail Fence Zone. If the **remotely piloted vessel** goes out of the Sail Fence Zone it will perform the following tasks:
1. The system sends a warning message to the Ground Control Station where the control of the **remotely piloted vessel** is performed.
2. The system goes into Safe Condition.
However, the pilot is to have the possibility to disable the function in the case of special procedures.
The system for stopping navigation is to be independent of other control systems and suitable for the operations carried out. The system is to be of fail-safe type. A failure of the stopping system is not to create the loss of the main control and command system and vice versa.
In the case of manually operated **remotely piloted vessels,** possible failures are:

- Failure of ground control station
- Failure of the data link
- Failure of the autopilot system

In the case of one of the a.m. 3 types of failure, the **remotely piloted vessel** is to gradually stop in safety inside the Sail Fence Zone. To satisfy what is requested above, it's possible to provide an automatic system independent of the control and command system that acts automatically in the case of loss of the data link signal. The system is to be set before the start of the navigation. This may be done by duplication of the autopilot system. It's possible also to use an additional data link to be used to shut off the propulsion system and the setting up of the safety operations in the case of failure of the main data link. When a part of the operation is set to be performed automatically under only the supervision of the pilot, the override of the pilot is to be possible in every situation.
The batteries are to be of a type suitable for a high number of charge/discharge cycles and to supply the current necessary to feed the engines.
In the case of a failure of any type in the remote control, the system is to automatically switch to the Safe Condition.
The **remotely piloted vessel** is to be equipped with the devices/systems necessary to carry out the operation in accordance with the applicable rules and also to communicate with the Navigation Control radio stations.
The **remotely piloted vessel** is to be equipped with an automatic or manual device to arrest the navigation when necessary in an emergency.

3.2.2 Data link

The data link that is part of the **remotely piloted vessel** is to ensure the execution of the functions of Command and Control with the necessary continuity and reliability in relation to the area of operation.
The data link is to use frequencies authorized and suitably selected so as to minimize the possibility of voluntary and involuntary interference that might affect the safety of operations.
The data link has to permit:

- Command and Control of the **remotely piloted vessel**
- activation of the system to stop the **remotely piloted vessel** manually

The systems are to be visible in every light condition.
The functioning of the data link is to be demonstrated in the electromagnetic environment where it's expected to work and together with the possible radio link used by other equipment.
Command and control is to be implemented by a radio link between the **remotely piloted vessel** and the ground station (Radio Line of Sight – RLOS). Trans-receivers are to be located in the **remotely piloted vessel** and in the remote control. The system to receive/transmit data is to include automatic devices to acquire the data link and to re-acquire it in the case of interruption of the data flow.
It is to be checked that, in the area of operation, the data link is reliable in terms of signal and continuity of the link, in particular in the case of obstacles.
The frequency of the data link in terms of modulation type and codification of the signal is to be chosen in order to avoid the risk of access to command or control by unauthorized persons.
The data link is to be ensured by radio line of sight link (RLOS). Data links based on other radio links or satellites are not acceptable.
The **remotely piloted vessel** is to have at least 2 links, RLOS type as described above. It is possible to foresee another additional data link through the internet.
In the case of failure of both the main links, the **remotely piloted vessel** is to:

- stop operations and shut off the propulsion
- if, after 60 seconds or less, the radio signal is not restored, the **remotely piloted vessel** is to set itself automatically in the Safe condition dropping anchor when possible, otherwise keeping the position using the dynamic positioning system.

The radio data link is to have priority over the internet link.
The authorized pilot/operator may operate the vessel through a dedicated internet access protected by login. Unauthorized people may only have

information relevant to the position of the vessel or other similar information.
The internet interfaces may have different levels of access. Some information may be kept free for everyone but for the command and control of the system and for the other advanced operations (e.g. service) access is to be granted only to authorized pilots.
Suitable means are to be provided to avoid unauthorized access.

3.3 Fire protection

3.3.1 Structural fire protection

The materials used on board are to be non-combustible.

3.3.2 Systems

In the enclosed spaces, according to the fire risk, a fixed fire-extinguishing system, remotely operated, is to be fitted.
At least one portable fire extinguisher is to be provided.

4 SAFETY SYSTEMS, VISIBILITY AND INDICATION, NAVIGATION LIGHTS AND EQUIPMENT

4.1 Safety systems

4.1.1 The **remotely piloted vessel** is to have an electronic system capable of detecting static or moving obstacles. In particular, when such a system detects an obstacle it is to:

- Activate an acoustic alarm
- Shut off the propulsion system
- Reduce the headway (e.g. stop the vessel changing the sense of rotation of the propeller/s).

The **remotely piloted vessel** is to wait for confirmation from the pilot before going again ahead. The pilot will decide whether to make the **remotely piloted vessel** go ahead, change direction or drop the anchor.
In the case of failure of the system to detect the obstacle, the **remotely piloted vessel** is to set itself automatically in the Safe Condition. From this condition, it's to be in any case possible for the pilot to lead the **remotely piloted vessel** to the shore manually.

4.1.2 The structure of the vessel is to be made, as far as practicable, with rounded surfaces protected with soft material to reduce the damage in the case of a collision with an obstacle.

4.1.3 The hull appendices are to be reduced, as far as practicable. Systems of steering without a rudder are to be preferred.
The propeller is to be suitably protected to avoid damage to obstacles. Water jets are to be preferred.

4.1.4 The anchor and the deckhouse are to be longitudinally and transversally included in the perimeter of the hull to avoid possible damage.

4.1.5 The **remotely piloted vessel** is to be efficiently lighted to be visible to other vessels.

4.2 Visibility and Indication

4.2.1 Visibility

The electronic means to give visibility located in an unprotected position are to be suitably protected against splashes and be capable of functioning in all the weather conditions that may occur.
There is to be an adequately unobstructed view in all directions from the remote position with the aid of the video camera.
The area of obstructed vision ahead of the vessel in all the load conditions from the remote position with the aid of the video camera is not to exceed 2 ship's length to the surface of the water.
The field of unobstructed vision from the remote position with the aid of the video camera is to be at least 320° and at least 220° from forward 110° each side.
The video camera is to be located outside the deckhouse in a suitable place in order to provide a view free from obstacles.
Two different systems are to be provided to give visibility of the external area of the remote pilot as if he were on board (e.g. with video-camera). One of the 2 systems required here is to be of a different type (e.g. one traditional camera and one thermic camera).
One submergible system is to be fitted to give visibility under water.

4.2.2 Indication

It is to be possible to recognize that it's a **remotely piloted vessel**. Suitable means are to be provided to give such information to other vessels.

4.3 Navigating lights, sound and equipment

4.3.1 Navigating lights and sound

Navigating lights and sound are to be in accordance with the applicable Rules (COLREG, CEVNI).

4.3.2 Navigational Equipment

The following equipment is to be foreseen:

- GPS,
- wind gauge,
- compass,
- radar,
- radar reflector,
- acoustic sounder,

- transponder, (only for operation at sea)
- radio,
- photo/videocamera,
- submersed photo/videocamera,
- webcam dome.

The following information is always to be available to the pilot:

- Speed,
- Position
- Trim/heel
- All the propulsion parameters such as battery status and autonomy
- Status of the data link signal
- GPS signal status
- Alarms: such as high temperature of the batteries, activation of the system to stop navigation, loss of the data link signal at the Ground Control Station or at the **remotely piloted vessel** itself.

5 OPERATING MANUAL AND MAINTENANCE

5.1 Operating Manual content

5.1.1 All **remotely piloted vessels** are to be provided with an Operating Manual or equivalent document providing the procedures necessary to manage the navigation operations and maintenance of the system.
Procedures are to be established also to prevent access by unauthorized personnel to the control station and its storage location.

5.1.2 The Manual is to include:

- limitations, if any
- the normal and emergency procedures for navigation,
- performance data,
- operative limitations, if any,
- clear indications of the tasks and responsibility of the operator,
- the list of equipment necessary on board for each type of operation,
- the program of maintenance,
- the specific procedures for the knowledge and adoption of the navigating requirements from the Authority,
- the controls that are to be performed before and after every operation including the verification of absence of electromagnetic interference and the necessary controls to ensure that the system is in good condition for the navigation,
- the system of registration of the operations,
- the procedures to avoid or reduce the risk of collision and other involuntary events,
- the geographic charts of the area of operations,
- the procedure to avoid or detect access of non-authorized persons on board the **remotely piloted vessel**,
- the periodical checks that are to be carried out for maintenance and the procedures for the replacement of each part of the system,
- the characteristics of the data link.

5.2 Maintenance

5.2.1 Rules for Maintenance

The **remotely piloted vessel** operator is to establish, on the basis of the manufacturer's instructions, adapted as necessary for the type of operations to be carried out, a proper maintenance program to ensure the continued seaworthiness of the vessel.
The operator is to establish a system of recording the data relating to navigation time, significant events concerning safety, maintenance and replacement of parts.
Only the manufacturer or other organizations recognized by the manufacturer are authorized to carry out maintenance of their **remotely piloted vessels**.
Routine maintenance may also be performed by operators having attended an adequate maintenance course held by the Manufacturer or by other organizations authorized by the Manufacturer.