Supply of Two (2) Hovercraft for the Hong Kong Police Force

Part VII – Technical Specifications

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Chapter 1 General Provisions

1.1 Introduction

1.1.1 This document (or "Technical Specifications" or "TS" or "Part VII") sets out the requirements of the Government of the Hong Kong Special Administrative Region ("HKSAR") of the People's Republic of China (hereinafter referred to as the "Government") in relation to two (2) **Hovercraft (each a "Hovercraft" or "Vessel")** for use by the Hong Kong Police Force **("HKPF" or "user department")**.

1.1.2 Unless otherwise specified in the TS, all the specifications stated in this Part VII of the Tender Document are classified and labelled as follows:

(a) Essential Requirements **[E]**;

(b) Those specifications which are without any label (viz., **[E]** or [D]) ("Specifications without Label"); and

(c) Desirable Specifications [D].

1.1.3 As part of the tender evaluation during the tendering stage (viz., completeness check), the Tenderer shall submit all the information sufficiently detailed to substantiate that the product and the services offered meet the Essential Requirements as stipulated in Annex C to Part II - the Conditions of Tender, failing which its tender will not be considered further.

1.1.4 All (a) Essential Requirements **[E]**, (b) if and to the extent the Contractor has indicated compliance, Specifications without Label, and (c) if and to the extent the Contractor has indicated compliance, Desirable Specifications labelled with [D], shall also form part of the Contract and be of equal materiality and importance upon the award of the Contract. Where the Tenderer has indicated non-compliance with any Specification without Label, it shall have proposed Counter-Proposals to such Specifications without Label in accordance with Clause 17.3 of Part II – Conditions of Tender for the Government's evaluation.

1.1.5 The Vessel shall be Ready for Use before the Delivery Date and delivered by the Delivery Date as per the schedule stipulated under Schedule 2 – Delivery Schedule of Part V.

1.1.6 Unless otherwise expressly defined in the Contract, all technical terms and expressions used in this Part VII shall be interpreted in accordance with the professional or common usage in naval architecture, marine engineering, nautical navigation and the shipbuilding industry.

1.1.7 Where design specifications of the Vessel or any Equipment are required to be approved by the specified Recognized Organization ("RO") or Relevant Authority[1] ("RA"), they must be approved by the specified RO or RA as well as by the Government New Construction Section ("GNC") and HKPF prior to the manufacture of the Vessel or procurement of such Equipment by the Contractor (as the case may be) (collectively, "GNC/HKPF"). Where the design specifications of the Vessel or Equipment (as the case may be) are not required to be approved by the specified RO or RA, they must be approved by GNC/HKPF prior to the manufacture of the Vessel or procurement of such Equipment by the Contractor.

1.1.8 For the avoidance of doubt, references to "tests" throughout the Tender Documents and the Contract shall include all inspections, surveys, assessments, trials and experiments.

1.1.9 Without prejudice and in addition to the interpretation principles set out in Clause 1.2 of the Part IV – Conditions of Contract, the following interpretation principles shall apply when interpreting the Tender Documents and the Contract including this Part VII:

[1] *Relevant Authority - Organisation/party which is authorized to act on behalf of National Government for survey and certify hovercraft to be used.*

(a) references to "Chapter" or "Paragraph" or "Annex" refer to the chapter of or the paragraph of or the Annex to this Part VII;

(b) quotation marks may or may not be added for each defined term whether with or without brackets; a defined term may be identified with quotation marks and brackets, or just quotation marks, or just brackets;

(c) the use of the article "the" may or may not appear before a defined term or an abbreviated term; there shall be no difference whether the term is preceded with or without the article;

(d) a defined term may have two or more versions (typically a longer version and an abbreviated version) (e.g. "Factory Acceptance Tests" or "FAT"); or may still be referred to by the original description of the subject matter based on which the term is defined; the original description; or the longer version of the defined term; or the shorter version of the defined term may be used interchangeably. For clarity sake, the original description, or the longer version may be used for more self-explanatory purpose; however, there shall be no difference;

(e) where a subject matter has been defined with two or more alternative terms of reference, any one of these terms of reference may be used interchangeably;

(f) a defined term may appear earlier than the provision in which it is defined; a term defined will have the same meaning throughout the document;

(g) there shall be no difference between a term with a hyphen and the same term without a hyphen (e.g., "sub-system" or "subsystem");

(h) titles and headings may appear in lower case or upper case throughout or only in upper case with the first word at the beginning; there shall be no difference in meaning;

(i) headings and titles do not affect the construction of the Tender Documents and the Contract;

(j) a sub-Section of this Part VII (at whichever sub-level and regardless of the numbering system adopted) may begin in upper or lower case and may be ended with semi-colon or full stop; these differences do not have any interpretation significance on their own;

(k) figures may be expressed in Arabic numerals or in words; or both; there shall be no difference; three zeros in a figure may or may not be separated by any space or comma; there shall be no difference; and

(l) where more than one unit of a subject matter is to be supplied as part of the Work, all requirements stated to be applicable to that subject matter shall apply to each such unit of that subject matter. This is regardless of whether the term "each of" or other cognate expression is used preceding that subject matter. This principle shall apply including without limitation where the subject matter is the Vessel and the Equipment on each Vessel.

1.2 Statement of Purposes of the Vessel

1.2.1 The Vessel shall be safe, fit and suitable for the operational requirements for which it is intended, namely to be used in supporting the operation of the mother Vessel navigated by the HKPF within Hong Kong Waters and in adjacent waters in emergencies. The primary role of the Vessel shall be undertaking sea safety patrols, search and rescue and law enforcement operations. As a secondary role, the Vessel shall be used to provide logistical support to HKPF officers. The Vessel shall also be capable of operating as a standalone unit for achieving these primary and secondary roles.

1.3 Authorities

1.3.1 The GNC of the Marine Department ("MD") is the section responsible for the procurement of the Vessel for the Government. GNC may delegate the site supervision work, including plan reviewing work during the construction stage to one or more private consultancy firm(s) on behalf of the Government.

1.3.2 Communications Branch ("COMMS") is the technical section within HKPF, which will oversee

the work to be provided by the Contractor, in connection with the Electronic Navigational Equipment ("ENE") as defined in Paragraph 9.1 of this Part VII and carry out Technical Acceptance of the Communication Equipment and ENE on behalf of the Government.

1.3.3 The HKPF is the end user of the Vessel and will participate in tests, inspections and trials together with GNC viz., the Technical and Delivery Acceptance of the Vessel on behalf of the Government.

1.4 Tenderer and Contractor

1.4.1 In addition to the drawings and information included in the Technical Proposal for the Vessel offered in its tender submission, the Contractor is obliged to prepare and submit comprehensive and detailed technical specifications of the Vessel, together with all necessary drawings and information, as required in this Part VII within the specified period of time and to the satisfactory acceptance by the RO or RA, GNC and HKPF. If no period is specified, they shall be submitted and approved by the RO or RA, GNC and HKPF (as the case may be) before the construction of the relevant part of the Vessel. Without prejudice to the Contractor's obligations for compliance with all contract requirements set out in this Part VII (viz all essential requirements, all requirements not marked as essential, and all desirable specifications committed by the Contractor) and any rights of the Government under the Contract or otherwise, the Contractor shall submit to GNC and HKPF supplementary drawings, information and deliverables that may be deemed necessary for the design and construction of the Vessel as required in Items 1 to 9 (Essential Requirements in Part VII) of Schedule 5 and other relevant parts of the Contract where applicable. Any intended technical solutions to be proposed by the Contractor to ensure the Vessel's compliance with each individual paragraph of the Technical Specifications shall be at least equivalent to or no less favourable than the respective contract requirements set out in this Part VII or otherwise, and shall be subject to the prior acceptance by GNC and HKPF before implementation of such intended technical solutions. In case of any discrepancies on interpretation of the technical specifications stipulated in this Part VII between the Contractor and the Government, the final decision on such intended technical solutions in fulfilling the fit-for-purpose standards and requirements shall be vested in GNC and HKPF.

1.5 Shipyard

1.5.1 The Contractor's nominated shipyard for building the Vessel must have the essential shipbuilding and workshop facilities such as lifting gear, hull construction and calibration equipment, machinery installation and calibration equipment and vessel launching or slipping facilities.

1.5.2 The Contractor shall employ a team of professional staff to carry out the design of the Vessel and also carry out supervision and quality control work in the course of Vessel construction.

1.6 Design and Construction Responsibility

1.6.1 The Vessel shall be designed and constructed for a service life of not less than fifteen (15) years under maintenance which is normally expected for the Vessel.

1.6.2 It is the sole responsibility of the Contractor to supply the Vessel which are safe, fit and suitable for the intended operational purposes of the HKPF as set out in Paragraph 1.2.1 above and which meets all relevant regulations and all specifications in this Part VII, which include without limitation requirements for safety, health, environmental protection, hull form design features, structure, method and materials for construction and outfittings, stability, sub-division and operational efficiency.

1.6.3 The Vessel shall be designed and constructed in accordance with one of the following:

(a) The National Standard of Hovercrafts published by People's Republic of China;

(b) "The Hovercraft Code" published by the Maritime Coastguard Agency, UK ;

(c) National Standard for Commercial Vessels ("NSCV") published by the Australian Maritime Safety Authority ("AMSA");

(d) the applicable requirements of RO or RA; or

(e) equivalent standard acceptable to the GNC and HKPF, in the version as at the Contract Date, which shall apply in relation to the relevant requirements specified therein.

1.6.4 The Vessel shall be issued with a Certificate of Compliance ("COC") as described in Paragraph 2.2.2 of this Part VII by the RO or by the RA, as one of the conditions, before the Acceptance Certificate for the Vessel may be issued. A sample of the COC is shown in Annex Annex 7 of this Part VII. All plans, particulars and documentation, which are required for the certification of the Vessel by the RO or RA, in addition to those listed in Annex 3 to this Part VII, shall be approved by the RO or RA before submission to GNC for endorsement and final approval prior to the commencement of work. Any subsequent modifications or additions shall be treated in the same manner. Those drawings which are not required under the ship certification approval process, shall be submitted to GNC for approval before work is carried out.

1.6.5 The Contractor shall design, build and supply the Vessel in full compliance with all requirements of the Contract including without limitation the Warranties, this Part VII and the Schedules; which may be over and above what is normally required by any statutory and/or RO or RA rules and/or regulations. Should there be any contradiction between the rules and regulations of the RO or RA and this Part VII, this Part VII shall prevail unless GNC stipulates or agrees otherwise.

1.6.6 Notwithstanding the submission of the preliminary plans and drawings by the Contractor as part of its tender for the Contract, all plans and drawings of the Vessel except the design stresses and scantlings, shall be submitted to GNC for approval before completion of the Vessel design.

1.6.7 Even if the Contractor may appoint a sub-contractor to design the Vessel with the prior written consent of the Government, the Contractor shall not be relieved of its obligations under the Contract through such appointment, and the Contractor shall be responsible for all acts, defaults and omissions of the sub-contractor as if they were its own.

1.7 Survey and Inspection

1.7.1 Tenderers shall note that the unit price per Vessel as quoted in Part V, Schedule 1, shall be deemed to have included the cost of surveys to be carried out by the relevant RO or RA in respect of that Vessel (if required to be arranged by the Contractor under the Contract).

1.7.2 All electronic items and their installation shall be approved and inspected by COMMS or COMMS representatives as part of Stage 3 of the Technical Acceptance.

1.7.3 Subject to Paragraph 1.7.8 of this Part VII, and unless the Government waives the same in writing, an advance written notice of not less than thirty (30) working days, must be given to GNC before the representatives of GNC and other Government officers are invited to conduct a survey visit of the Vessel. If insufficient notice is given the Government reserves the right only to make such visit after the appointed date and the liability for any delay resulting therefrom shall be borne by the Contractor including any liquidated damages payable under Schedule 4 to Part V.

1.7.4 The Contactor shall provide:

(a) An Implementation Timetable, in the form set out in Annex 2 to this Part VII, setting out the major milestones and their scheduled completion dates and incorporating the Delivery Dates specified in Schedule 2 of Part V;

(b) The Drawing Submissions Timetable in the form set out in Annex 3 to this Part VII; and

(c) The Main Items Inspection Timetable in the form set out in Annex 4 to this Part VII.

Each one of the above shall be submitted to GNC for approval by the respective deadlines specified in Clause 11 of Part IV - the Conditions of Contract.

The Delivery Date(s) for the Vessel(s) as stated in the Implementation Timetable, shall be no later than those set out in Schedule 2 of Part V.

1.7.5 Notwithstanding anything in the Contract to the contrary, the Government may suspend payment of any of the instalment specified in Schedule 3 of Part V of the Contract, if any of the timetables required herein has not been submitted for GNC's approval or GNC does not approve any of them or, if the progress of work does not comply with any of them as approved by GNC.

1.7.6 A weekly work progress report with photographs evidencing the progress and material / equipment procurement status is required to be submitted to GNC during the construction of the Vessel. The weekly report shall be submitted before noon of every Monday. The Contractor shall provide supporting evidence, including but not limited to photos and videos, to demonstrate that the milestones have been completed according to the completion dates stated in the submitted Implementation Timetable in Annex 2 to Part VII.

1.7.7 GNC may designate consultant(s) from the private sector who will be authorised to represent GNC in all technical matters including site visit and plan approval related to the construction of the Vessel. The Contractor shall cooperate with the consultant(s) and afford unhindered access to the Vessel at all times during working hours and shall furnish current copies of all drawings, sketches, correspondence, change notices, change orders, test agendas, schedules and other necessary documents where applicable. For the Main Items Inspection Timetable set out in Annex 4 to this Part (even in the version approved by the Government), the GNC consultant will further elaborate such timetable by including and expanding on these items into an on-site supervision programme ("Programme"), and which Programme shall be deemed to form part of the Contract and superseding Annex 4 (even in the aforesaid approved version) in the event of any inconsistency where the Programme is more detailed than Annex 4 to this Part. All these inspections, tests and trials must have been performed to the satisfaction of the Government before the Vessel may be shipped to Hong Kong (unless it is expressly stated in Annex 4 to this Part that certain items shall be performed in Hong Kong as part of the Delivery Acceptance)

1.7.8 After arriving at site for a survey visit, if GNC officers or consultants consider that it is unsafe to carry out the test or inspection, the test/inspection will not be carried out. The Contractor shall arrange for another additional survey visit at the Contractor's expense. The Government shall not be responsible for any delay arising from any postponement in conducting the survey visit due to any safety issue as specified in this paragraph.

1.7.9 Where any fee charge and associated expense are payable for the services of the RO or RA, which are necessary in order to fulfil any obligation of the Contractor under the Contract, the Contractor is responsible to pay the RO or RA all such fees, charges and associated expenses. Such fees shall include charges for drawing approval, surveys (if deemed necessary), issue of certificates and, any other expenses payable to the RO or RA.

1.7.10 The Contractor shall provide office space for GNC officers, HKPF officers and consultants during their survey visits and construction progress visits to the Vessel at the shipyard where the Vessel are constructed. The office space shall include, but not be limited to, two (2) desks, four (4) chairs, one (1) telephone, one (1) conference table, drinking facilities, power supply and one (1) cupboard for storage of documents and working clothes. The space provided by the Contractor shall also be fitted with air conditioning/heating, have internet access with WiFi connection, and a copying and printer machine. Cleaning of the space shall be carried out on each working day.

1.7.11 The hours of work of the GNC officers, HKPF officers or consultants will be arranged to coincide with those of the shipyard, insofar as is practicable to do so. It is intended that all reasonable steps are taken so that the duties of the GNC officers and consultants can be carried out with maximum efficiency and minimum interference with the Contractor's work.

1.8 Procedures for Vessel Acceptance

1.8.1 **Stage 1 of Technical Acceptance – Pre-Shipment and Handling Inspection**

(a) Safety of Vessel for Pre-Shipment Construction and Handling Inspection

Prior to conducting the Pre-Shipment Construction and Handling Inspection, an Inclining experiment (if applicable) or other means acceptable to GNC in determining the final lightship data shall have been carried out and approved by the RO or RA and the GNC. All loading conditions used during the Pre-Shipment Construction and Handling Inspection shall be compiled using the approved final lightship weight and centre of gravity. Stability test/calculation to demonstrate the Vessel meeting the requirement in Paragraph 3.3 of this Part VII shall also be carried out before proceeding further. Other documentary evidence acceptable to the Government showing that the Vessel is safe to go to sea for the intended tests and trials specified in the Contract shall be submitted.

(b) Handling Assessment of Vessel

On completion of construction, and prior to shipping to Hong Kong if the building location is outside of Hong Kong, a Handling Assessment for the Vessel shall be carried out as per requirements and procedures given in Annex 14 to this Part VII at or near the site where the Vessel is constructed.

(c) System Inspection Test

The Contractor shall propose and demonstrate to GNC and HKPF representatives a test protocol to fully demonstrate that the Vessel, the outfitting, machinery, electrical and electronic systems are in complete condition and good working order, as specified in Annex 4 to this Part VII. This will include a practical demonstration of its performance and sea keeping abilities.

(d) Pre-Shipment Speed Trial

Pre-Shipment Speed Trial shall be carried out at or near the site where the Vessel is constructed and shall be carried out in the presence of GNC officers and HKPF representatives or their appointed agents. The same conditions as set for the Official Speed Trial specified at Paragraph 1.8.2 of this Part VII shall apply in which the test is to be carried out.

The purpose of this Inspection will be for the Government to satisfy itself that the Vessel is, in all respects, ready for shipment to Hong Kong (if constructed in a place outside the HKSAR) to undergo the Official Sea Trial. This inspection visit may have been preceded by one or more similar visits following which necessary modification work, if required, has been completed. The Contractor shall provide GNC with one (1) month's advanced written notice of its readiness to invite the Government to conduct the Pre-Shipment Construction and Handling Inspection or, otherwise, as agreed by the Government.

The Pre-Shipment Construction and Handling Inspection of the Vessel shall be conducted at sea in the country in which the Contractor has built the Vessel (if the Contractor has built the Vessel in a place outside the HKSAR) to confirm that the construction of the Vessel conforms with the requirements of Clause 2.5 of Part IV, that any outstanding modification work required to be performed under Clause 2.7 of Part IV, Paragraph 1.2.1 of this Part VII or under any provision of the Contract Documents has been completed satisfactorily. To mitigate the commercial risk which would result from shipment of the Vessel to Hong Kong and possible subsequent failure of the Official Sea Trial specified in Paragraph 1.8.2 of this Part VII, this Pre-Shipment Construction and Handling Inspection shall include but not be limited to a speed trial conducted by the Contractor under the same conditions as set for the Official Speed Trial specified at Paragraph 1.8.2 of this Part VII. The purpose is to enable early identification and rectification of undesirable performance before shipment.

(e) ENE

All ENE which are specified to be tested as per Chapter 9 of this Part VII under Stage 1 - Pre-Shipment Construction and Handling Inspection.

(f) Hull Bottom Inspection

Upon successful completion of the Pre-shipment Speed Trial and Handling Assessment, the Contractor shall arrange a hull bottom inspection on the Vessel for GNC officers to check for any hull damage before shipping to Hong Kong. Any hull damage found shall be rectified at or near the site where the Vessel is constructed.

(g) Factory Acceptance Test

All factory acceptance tests mentioned in this Part VII shall be conducted as part of this Stage 1 of the Technical Acceptance. The Contractor shall provide to GNC, HKPF and where applicable COMMS the test plan and test results of each of the factory acceptance tests for approval before these tests are deemed successfully completed.

(h) Condition for proceeding to Stage 2

After meeting all the requirements of this Stage 1 of Technical Acceptance – Pre-Shipment and Handling Inspection, the Vessel shall then be shipped to Hong Kong and shall proceed to Stage 2 – Official Sea Trial.

1.8.2 **Stage 2 of Technical Acceptance - Official Sea Trial**

(a) Condition and Location of Carrying out Official Sea Trial

The Official Sea Trial shall be carried out in Hong Kong in the presence of GNC's officers or consultants and the HKPF representatives.

(b) Official Sea Trial Programme

The Contractor shall submit an Official Sea Trial programme for GNC's approval, at least fifteen (15) working days in advance of the Official Sea Trial, which shall include details of proposed procedures for carrying out the Official Speed Trial, Endurance Test, Manoeuvring Test, Steering Test, Heeling Test at a Turning Speed, Crash Stop Test, Astern Running Test, Emergency Steering Test, Anchoring Tests and other tests stated in this Paragraph 1.8.2.

The Official Sea Trial programme shall be written in accordance with RO or RA requirements and requirements set out in this Part VII, making reference to international standard such as ISO 19019-2005: Sea-going vessels and marine technology – Instructions for planning, carrying out and reporting sea trials. Documentary evidence acceptable to the Government showing that the Vessel is safe to go to sea for the intended tests and trials specified in the Contract shall be submitted together with the aforesaid programme.

(c) Cost and expenses for carrying out tests and trials

As in all other tests and trials to be conducted for the Vessel acceptance, the Contractor shall be required to carry out the Official Sea Trial in Hong Kong at its own expense (including, but not limited to the expense of fuel, lubrication oil, crew and other necessary expenses). Before the Official Sea Trial, the Contractor shall observe the certificate of competency and third party insurance requirements under the Laws of Hong Kong.

(d) Contractor's staff onboard the Vessel during the trial

To ensure that the Official Sea Trial can be conducted safely and in accordance with the Laws of Hong Kong, the Contractor shall provide GNC with appropriate details about each one of the Contractor's staff who will be onboard. These details shall include the name, post, duty, experience and certificate(s) of competency to be submitted at the same time as the

Official Sea Trial Programme specified at Paragraph 1.8.2(b) of this Part VII. The number of persons onboard during a particular test or trial shall be agreed by the GNC officers and HKPF representatives. The location of each person onboard, which can affect the centre of gravity of the Vessel under trial, shall also be first agreed by the GNC officers and HKPF representatives and shall be weighted and recorded.

(e) Loading condition for Tests and Trials all tests and trials of the Official Sea Trial

The loading condition to be used during tests and trials are specified below:

	Operational Load Condition
Loading condition	Full Load
Fuel (minimum)	90%
Crew	2
Officer	1
Equipment	20 kg
Dummy weight	To top up the Payload at 280 kg (Crew + Officer + Equipment+Dummy weight = 280 kg)

All loading conditions being used during the Official Sea Trial shall be complied by using the approved final lightship weight and centre of gravity. All such loading conditions shall meet the stability criteria as specified in Paragraphs 3.3.1 of this Part VII. Other documentary evidence acceptable to the Government showing that the Vessel is safe to go to sea for the intended tests and trials specified in the Contract shall be submitted.

(f) System Inspection Test

The Contractor shall propose and demonstrate to the GNC and HKPF representatives a test protocol to fully demonstrate that the Vessel, the outfitting, machinery, electrical and electronic systems are in complete condition and good working order. This shall include, but not be limited to:

(1) Start test for propulsion (thrust) and lift engines;

(2) An anchoring test to meet the RO or RA requirements;

(3) An insulation test of the electrical system to the satisfactory of RO or RA and GNC; and

(4) Other tests required by the RO or RA, GNC, HKPF, COMMS or their appointed representatives.

(g) Official Speed Trial

As part of the Official Sea Trial, the Contractor shall carry out the Official Speed Trial to determine whether the Vessel, powered by its propulsion (thrust) and lift system as per Paragraph 2.3 of this Part VII, can achieve the Contract Speed in Hong Kong. The Contractor shall carry out the Official Speed Trial in the presence of GNC officers, HKPF officers or the appointed consultant(s).

(1) The Official Sea Trial shall be carried out in Hong Kong waters under the conditions

specified in Annex 5 to this Part.

(2) The Official Speed Trial shall be carried out referring to international standards, such as ISO 15016:2015 - Ships and Marine Technology - Specification for the assessment of speed and power performance by analysis of speed trial data, to the satisfaction of GNC.

(3) The actual mean speed of the Vessel (i.e. NOT theoretical) shall be measured during the Official Speed Trial runs to determine if the Contract Speed can be achieved. The speed calculations must NOT be corrected by wind, wave, tidal current, shallow water effects and weather conditions.

(4) The actual mean speed shall be calculated as the arithmetic mean of not less than FOUR (4) continuous runs, i.e. TWO (2) runs in each direction. The speed for each run shall be calculated by measuring the time of the Vessel running for one nautical mile by a measuring method acceptable to GNC.

(5) The speed for each run shall be measured by the instruments provided either by:

(i) The Contractor, on the condition that the instrument has been calibrated by a certified body recognized and acceptable to GNC and HKPF with calibration certificate issued no earlier than 12 months prior to the Official Speed Trial; or

(ii) Other speed measuring methods acceptable to GNC and HKPF.

(6) The Contract Speed is considered not achieved if the Contract Speed cannot be attained during the official speed trial if a minimum of two sets cannot achieve the Contract Speed out of a maximum of FIVE sets with each set comprising two runs (in opposite directions).

(7) The Contract Speed stated in Paragraph 2.3 shall be achieved by the Vessel in the Official Speed Trial Conditions, as specified in Annex 5 to this Part VII, with the engine power at the declared 100% Maximum Continuous Rating ("MCR"). The Contract speed shall be calculated from the highest mean speed between to-and-from directions of the runs. If the Vessel fails to achieve the minimum Contract Speed, the Government will deem that the Vessel has failed to pass the Official Sea Trial whereupon the Government shall have all rights as specified in Clause 12.6 of Part IV.

(8) All Equipment shall also be in operation during the Official Sea Trial unless explicitly exempted by GNC or HKPF.

(9) The Vessel must be in the trial conditions (see Annex 5 to this Part for the conditions of the trials) during the Official Speed Trial. All Equipment shall also have passed all tests and trials in Stages 1 and 2 of the Technical Acceptance and which operation shall not be affected during the Official Sea Trial.

(10) The speed, time of the day, engine running conditions, sea condition, etc., shall be properly recorded by the Contractor, and signed as witness by GNC surveyor (or GNC representatives) during the Official Sea Trial. A copy of the Official Sea Trial Report as required in sub-paragraph (n) below shall be given to GNC before Delivery Acceptance.

(h) Endurance Test

The Endurance Test shall be carried out on the engines within the manufacturer's recommended engine operating conditions. The test results shall be recorded in accordance with the requirements stipulated in Annex 6 to this Part VII. The report submitted shall include a curve or curves showing the Vessel speed versus engines rpm and power, with particulars of the Vessel loading in the test(s).

(i) Manoeuvrability Test

Forward turning circle tests to port and starboard sides shall be carried out.

On an air-cushion moving on and off the landing site and the cradle as detailed in Paragraph 3.11 of this Part VII, under representative loading condition, shall be carried out.

All other tests and trials as required in one of the following standards: The National Standard of Hovercrafts; The Hovercraft Code (including but not limited to Section 28 of The Hovercraft Code); National Standard for Commercial Vessels ("NSCV") or equivalent.

(j) Crash Stop Test

The minimum time and distance achievable by the Vessel, when running from full ahead, to stop.

(k) Electronic Navigational Equipment ("ENE") items Test

All ENE items shall be tested as per Chapter 9 of this Part VII under Stage 2 - Official Sea Trial.

(l) Hull Bottom Inspection

Upon successful completion of the Official Speed Trial in Hong Kong, the Contractor shall arrange with GNC officers to carry out a hull bottom inspection on the Vessel to check for any hull damage before delivery. Any hull damage found shall be rectified to the satisfaction of GNC before the Vessel can be accepted.

(m) Tests and Trials Required

The Contractor shall re-perform the tests and trials as mentioned in this Paragraph 1.8.2 above as part of Stage 2 of the Technical Acceptance even if these tests have already been performed as part of Stage 1 of the Technical Acceptance. If these tests and trials are not passed under Stage 2 of the Technical Acceptance, the whole of the Technical Acceptance shall not be deemed to have been successfully completed.

(n) Submission of Official Sea Trial Report

The Contractor shall provide an Official Sea Trial Report, written in accordance with RO or RA requirements and applicable standards, acceptable to GNC. The Report shall contain, but not be limited to the speed, engines running conditions, vessel load conditions, performance data sought by respective tests or trials, time of day, weather, wind and sea conditions, which will be witnessed and signed by the GNC surveyor (or the GNC representative) and the HKPF representative during the Official Sea Trial. The Official Sea Trial Report shall be submitted to GNC before Delivery Acceptance.

1.8.3 **Stage 3 – Technical and Operational Acceptance**

(a) The Contractor shall re-perform the tests as mentioned in this Paragraphs 1.8.3(b) and 1.8.3(c) below as part of Stage 3 of the Technical Acceptance even if these tests have already been performed as part of Stage 1 or Stage 2 of the Technical Acceptance. If these tests are not passed under Stage 3 of the Technical Acceptance, the whole of the Technical Acceptance shall not be deemed to have been successfully completed.

(b) The Contractor shall under this Stage 3 of the Technical Acceptance carry out the bench acceptance test and on-site commissioning test for ENE as mentioned in Chapter 9 of this Part VII, and all other verification tests to determine whether or not the Vessel including the Equipment has been supplied in accordance with all the specifications set out in these Technical Specifications set out in this Part VII.

(c) All electronic items and their installations shall be approved and inspected by COMMS as part of the Technical and Operational Acceptance.

(d) The Contractor shall supply all necessary equipment and labour at its own cost for carrying

out the tests and trials stated in Paragraphs 1.8.3(a), (b) and (c) of this Part VII.

(e) If the Vessel cannot pass all of the tests comprising the Technical and Operational Acceptance by the deadline specified in the Contract, the options available to the Government are set out in Clause 12 of the Conditions of Contract and other applicable provisions of the Contract.

1.8.4 **Stage 4 – Delivery Acceptance**

(a) The Vessel, after its successful completion of all Stage 1 to 3 as mentioned in Paragraphs 1.8.1 to 1.8.3 above (collectively, "Technical Acceptance"), shall be delivered at the Contractor's expense to the Government Dockyard. If there is any delay in the delivery of the Vessel in Ready to Use condition for more than 120 days after the scheduled Delivery Date specified in Schedule 2 of Part V, at the discretion of the Government, the Contract may be terminated according to the applicable terms stipulated in the Contract.

(b) All Deliverables including all Documentation, all Spare Parts and all Warranty Spare Parts required prior to and at the Delivery Acceptance shall all be delivered in accordance with Paragraph 10.2 of this Part VII.

(c) The Contractor must provide fourteen (14) days' advance notice, in writing, when the Vessel is considered completed in accordance with the Contract and Ready for Use and is ready to be delivered for the Delivery Acceptance. The Government will not accept delivery if, after undergoing the tests and trials in the Technical Acceptance, the Government does not consider that the Vessel is in a Ready to Use condition.

(d) Not later than six (6) weeks before the Delivery Acceptance of the Vessel, the Contractor is required to submit to GNC four (4) copies of the Inventory List covering all items of or relating to the Vessel including all engines, on board equipment, manuals, documentation, spares, stores, and equipment for testing in respect of the entire Vessel. The Inventory List shall be approved by GNC seven (7) days before the day of Delivery Acceptance and covers everything which the Contractor is required to deliver under the Contract. At the Delivery Acceptance of the Vessel, the approved Inventory List will be used to check that all the items have been delivered to GNC and in case of the Warranty Spare Parts, have been delivered to the Contractor's local agent in a satisfactory state. Details of each inventory item shall include: item name, description, type, quantity, manufacture's name and contact details, part reference number and/or serial number, and the items' locations in the Vessel.

(e) The items specified in Paragraph 10.2 of this Part VII, all items listed in Annex 7 to this Part VII, all items set out in the Inventory List in the form as approved or stipulated by the Government, and all other items which are required to be delivered under this Part VII as part of the Delivery Acceptance shall be delivered to GNC as part of the Delivery Acceptance of the Vessel.

(f) During the Delivery Acceptance, the Contractor must demonstrate to GNC that all hull construction, outfitting, machinery, electrical and electronic equipment are in good working order, and must hand over the Vessel, its fixtures and Equipment to GNC in good and complete condition.

(g) On delivery, the Vessel must be in a clean, tidy, fully fitted and operational condition to the satisfaction of GNC.

(h) Aside from passing the Technical Acceptance and the Delivery Acceptance, the Certificate of Compliance for the Vessel shall be issued by the relevant RO or RA as specified in Paragraph 2.2.2 of this Part VII before the Government will issue the Acceptance Certificate. A sample Certificate of Compliance can be found in Annex 7 of this Part VII.

(i) The Delivery Acceptance of the Vessel shall be carried out by GNC in accordance with the terms stipulated in the Contract. The Delivery Acceptance is only completed once the Director of Marine has issued the Acceptance Certificate.

1.9 Warranty Services During the Warranty Period

1.9.1 Notwithstanding and without prejudice to the Contractor's obligation to provide the Warranty Services for the Vessel under the Conditions of Contract, the original copy of the manufacturer's warranty certificates and all related manuals and documents in respect of all the Equipment, valid for Twelve (12) months from the date of Acceptance Certificate of the Vessel, shall be delivered to GNC upon Delivery Acceptance.

1.9.2 The full scope of Warranty Services is set out in Annex 1 to this Part VII.

1.9.3 The Contractor is responsible for arranging the Vessel for Guarantee Slipping at the end of the 12-month Warranty Period. In addition to any defects which the Contractor may be required to fix as part of the Warranty Services as stated in Annex 1 to this Part VII, the Contractor shall also be responsible for the rectification of any defects found in the course of Guarantee Slipping. The full scope of the Services to be provided as part of the Guarantee Slipping is set out in Annex 1 to this Part VII.

1.10 Support Services

1.10.1 The Vessel shall be designed for through life support and easy maintenance in the HKSAR based on the operational profile and minimum life expectancy as specified in this Part VII.

1.10.2 The above also applies to the engines for propulsion as well as all other equipment installed in the Vessel. Support and maintenance services shall be available (i.e. serviceable) in Hong Kong in respect of all equipment installed in the Vessel and return of the whole or part of the Equipment to the original place of manufacturer or supplier shall not be necessary in order to carry out any repair work.

1.10.3 The Contractor shall provide a whole life support plan for the timely procurement of spare / replacement parts and the undertaking of preventative maintenance with the Vessel as specified in Paragraph 10.2.3 of this Part VII.

1.11 Asbestos Free

1.11.1 The Vessel must not contain any asbestos or asbestos containing materials. The Contractor must comply with Hong Kong Air Pollution Control Ordinance (Cap. 311), Part X. The Contractor shall engage a service provider approved by RO or RA or other entities acceptable by GNC to verify that there is no asbestos on the Vessel. An asbestos free certificate or statement of compliance issued by the service provider to this effect shall be provided upon delivery of the Vessel.

Chapter 2 General Technical Requirements

2.1 Introduction

2.1.1 Without prejudice to the generality of Chapter 1 of this Part VII, this Chapter contains the more particular technical specification for the Vessels. The significance of Essential Requirements **[E]** is explained in Paragraph 1.1 of this Part VII.

2.1.2 The work to be performed under this Contract consists of the design, construction, outfitting, testing and delivery of two (2) Vessel. Workmanship, functions, characteristics and performance shall be in accordance with this Part VII, best marine construction practices and, the regulatory standards herein specified or otherwise applicable.

2.1.3 The Contractor shall exercise its professional expertise and knowledge to come up with an appropriate design for the Vessel, which can comply with all requirements of the Contract. The Conceptual General Arrangement Plan ("Conceptual GA Plan") at Annex 10 to this Part VII serves only as a set of reference drawings to assist in illustrate how the tender requirements stated in this Part VII could be complied with, and is by no means a mandatory design layout of the Vessel. The Tenderer's tender would not be disqualified for not complying with the Conceptual GA Plan provided all essential requirements are complied with.

2.1.4 The design and construction of the Vessel, the Contractor shall submit a detailed General Arrangement Plan ("GA Plan") and all other construction drawings for GNC approval and acceptance.

2.1.5 The design of the offered Vessel shall be either one of the following:

(a) The same as the design of any other existing hovercraft, whether designed and built or just built by the Tenderer or another person, where the proposed Vessel shall have the same principal dimensions of the hull including length, breadth and depth, and the same hydrostatic particulars and hull characteristics as that existing hovercraft ("Existing Hovercraft"). The existing design of the propulsion system shall be in compliance with the Contract Speed requirements in Paragraph 2.3 of this Part VII; or

(b) A design with modifications from the design based on an existing hovercraft with a length of the hull between 3.9 m and 5.8 m (both figures inclusive) with similar hull characteristics of the offered design ("existing design"). The design with modifications shall meet the Contract Speed requirements specified in Paragraph 2.3 of Part VII. Whilst the Government reserves the right to ask for submission if found missing in the tender after the Tender Closing Date, the Tenderer shall prove that the modified design comply with the Contract Speed requirements as aforesaid by either through the provision of the corresponding model test report or otherwise to the satisfaction to the GNC and HKPF.

2.1.6 All the machinery, equipment and facilities, furniture, fixtures and fittings, including outfitting of the Vessel that are described in this Part VII, together with their requirements for design and installation standards that are stipulated in any parts of this Chapter 2 and any other parts of this Part VII, are the items that must be included in the complete "As-built" Vessel delivered to the Government.

2.2 Rules and Regulations

2.2.1 The Vessel shall be designed and constructed in accordance with one of the following standards: The Hovercraft Code; National Standard for Commercial Vessels ("NSCV"); The National Standard of Hovercrafts; the applicable type approval of RO or RA; or equivalent, in the latest version as of the Contract Date. **[E]**

2.2.2 The Vessel shall be issued with a Certificate of Compliance ("COC") issued by the RO or RA. A sample COC can be found in Annex 7 of this Part VII, certifying that the Vessel is in compliance with one of the following standards:

(a) The Hovercraft Code;

(b) National Standard for Commercial Vessels ("NSCV");

(c) National Standard of Hovercraft;

(d) Applicable rules of RO or RA; or

(e) Other equivalent standard acceptable to the GNC and HKPF.

2.2.3 The Vessel shall be surveyed by the representatives of the RO or RA during construction for compliance with the plans, particulars and documentation approved by the RO or RA and by GNC, including relevant tests and trials. Records of survey shall be submitted to GNC on request.

2.2.4 The Contractor shall design, build and supply the Vessel in full compliance with the requirements given in this Part VII, which to that extent, may be over and above what is normally required by any statutory and RO or RA requirements. Should there be any contradiction between the RO or RA requirements and this Part VII, the final decision shall rest with GNC.

2.2.5 Without prejudice to the general requirements that the Contractor shall perform all Work in full compliance with all applicable laws and regulations and in full compliance with the requirements of the Contract, including this Part VII, the construction of the Vessel must comply with the requirements of the RO or RA specified in Schedule 9, or the requirements of any of the RO or RA listed below (where it is expressly specified in this Part VII in relation to a particular requirement, another RO or RA which is any one of the RO or RA listed in sub-Paragraphs (a) to (j) below may be designated for compliance with the relevant requirement) and also the requirements further specified in sub-Paragraphs (j) to (o) below:

(a)	American Bureau of Shipping	ABS
(b)	Bureau Veritas SA	BV
(c)	China Classification Society	CCS
(d)	DNV AS	DNV
(e)	Korean Register	KR
(f)	Lloyd's Register Group Limited	LR
(g)	Nippon Kaiji Kyokai	NK
(h)	RINA Services S.p.A.	RINA
(i)	Russian Maritime Register of Shipping	RS

(j) An organisation or party which is authorized to act on behalf of the National Government for survey and certify hovercraft to be used (Relevant Authortity ("RA"))

(k) International Electro-technical Commission ("IEC") Regulations for the Electrical and Electronic Equipment:

(1) IEC 60092 – 350, Electrical Installations in Ships – Part 350: Shipboard Power Cables – General Construction and Test Requirements;

(2) IEC 600332-1 (All parts), Test on electrical and optical fibre cables under fire conditions – Part 1: Test for vertical flame propagation for a single insulated wire or cable; and

(3) IEC 600332-3-22, Test on electrical cables under fire conditions – Part -3-22: Test for vertical flame spread of vertically mounted bunched wires or cable – Category A.

(l) International Telecommunications Union recommendations in the International Radio Regulations ("ITU-R");

(m) Quality and standards of the welding shall comply with the rules of one of the RO or RA

listed in sub-paragraphs (a) to (j) above or the American Welding Society ("AWS") or other applicable international standards or rules acceptable by GNC;

(n) International Regulations for Preventing Collisions at Sea 1972, and all the effective Resolutions by the International Maritime Organization ("IMO");

(o) All applicable Hong Kong laws and regulations including the applicable Code of Practice as from time to time published on the website of the Marine Department ("COP");

(p) International Organization for Standardization:

(1) ISO 12215 – Small craft – Hull construction and scantlings;

(2) ISO 12216 – Small craft – Windows, port lights, hatches, deadlights and doors. Strength and watertightness requirements;

(3) ISO 10133 – Small craft – Electrical equipment – Extra low-voltage D.C. installations;

(4) ISO 7840 – Small craft – Fire resistant fuel hoses;

(5) ISO 8846 – Small craft – Electrical devices – Protection against ignition of surrounding flammable gases;

(6) ISO 10088 – Small craft – Permanently installed fuel systems and fixed fuel tanks;

(7) ISO 13297 – Small craft – Electrical systems – Alternating current installations;

(8) ISO 10592 – Small craft – Hydraulic steering systems; and

(9) ISO 9094-1 – Small craft – Fire protection.

(q) All equipment / fittings shall be designed and manufactured to at least the standards as specified in these Technical Specifications. When none of the rules and regulations in Paragraphs 2.2.5(k) to (o) above are applicable, then the applicable standards specified by the applicable organisations below shall be complied with:

BSI	British Standards Institute
GB	Standardization Administration of the People's Republic of China
IEEE	Institute of Electrical and Electronic Engineers
ISO	International Organization for Standardization
JIS	Japanese Industrial Standards

In the event of any inconsistency amongst the above requirements, rules and standards, those mentioned in sub-Paragraphs (k) to (o) shall prevail over the requirements of the relevant RO or RA as listed in sub-Paragraphs (a) to (j) above.

2.3 Contract Speed

2.3.1 In a fully loaded condition with 90% fuel capacity and three (3) persons on board as specified in Chapter 1.8.2(e) of this Part VII, the minimum highest achievable speed under the Official Speed Trial Conditions as stated in Annex 5 to this Part shall be as follow:

Minimum highest achievable speed on water:	15 knots	**[E]**

2.4 Principal Dimensions

2.4.1 The principal dimensions of the Vessel shall be as follows:

Length Overall:	3.9 – 5.8 metres **[E]**
Extreme Breadth:	2 – 3 metres **[E]**
Maximum Height:	less than 3 metres

2.5 Material of the Construction

2.5.1 The material of hull and skirt shall be as follows:

Hull:	Marine Grade Glass-reinforced plastic ("GRP") or equivalent. **[E]**
Skirt:	The material shall comply with The Hovercraft Code, or The National Standard of Hovercraft or equivalent standard. **[E]**

2.6 Propulsion System

2.6.1 The Vessel shall be equipped with power systems including with separate fans for propulsion (thrust) and lift. **[E]**

2.7 Vessel Operating Profile and Environment

2.7.1 The Vessel shall be designed to carry three (3) persons with seating provided, with a total payload of at least 280 kg as per the conditions specified in paragraph 1.8.2(e) of this Part VII.

2.7.2 Summary of Operational Hours / Range

Number of hours / day:	4 hours / day
Number of days / year:	90 days / year
Endurance for fuel capacity:	The fuel tank(s) onboard the Vessel shall be able to carry sufficient fuel for a minimum 2 hours at the Contract Speed as per Paragraph 2.3 of this Part VII without refuelling. **[E]**

2.7.3 The Vessel shall be able to operate (fulfil its operational roles) safely within Hong Kong over ground as well as water surface. The Vessel shall be capable of deploying in mudflat areas outside mangrove forested areas and along major channels within mangroves. It shall be capable of operating over mud, very shallow water, swampland, marshland, beaches and concrete slipways.

2.8 Markings and Colour Scheme

2.8.1 The marking and colour scheme for the Vessel shall be in accordance with the requirements given in this Part VII.

2.8.2 The Contractor shall provide the markings and colour scheme for the Vessel, which shall be in accordance with the requirements given in this Part VII. All painting colour schemes for the Vessel and fittings shall be approved by GNC and HKPF before application

2.8.3 All marks, names, insignia and other colour markings should be in a colour contrasting with the hull and console colour.

2.8.4 All labelling shall be in both English and Traditional Chinese and as per applicable rules and regulations. The HKPF logo shall also be displayed on both sides of the Vessel and at locations as directed by GNC and the HKPF during the kick-off meeting.

2.8.5 The Vessel's name shall be marked permanently on both sides of the console of the Vessel. Details of the size and calligraphy shall be confirmed by GNC and the HKPF.

2.8.6 All labelling, stencilling and marking (not limited to the hull but including all aspects of the Vessel) shall be made on separate plaques, boards or labels attached to the structure. By default all displays, control actuators, electric switches, valves, and other equipment shall be labelled to indicate their type and function as appropriate.

2.8.7 Safety markings for the prevention of person tripping in the Vessel shall be provided where necessary.

2.9 Tally Plates

2.9.1 The following information shall be displayed on the builder's plate:

(a) Builder's name;

(b) Vessel's name;

(c) Year of manufacture; and

(d) Maximum number of persons including the crew that the Vessel is designed to carry.

2.9.2 Tally plates in both English and Traditional Chinese characters shall be fitted for all spaces and all equipment as required by GNC including but not limited to:

(a) Equipment in the console;

(b) Electrical and communications equipment;

(c) Air vents and filling pipes for the fuel oil tanks;

(d) All valves and equipment on deck;

(e) Control panels, switchboards, distribution boxes and electrical circuits; and

(f) Any other equipment / fitting as required.

Information engraved on the tally plates shall include: service, function, mode of operation, source of power, fuse rating, voltage, warnings and other information as required by GNC and HKPF.

2.9.3 Tally plates exposed to weather shall be made of durable and weatherproof material and be securely fastened.

2.9.4 List of tally plates shall be provided as directed by GNC and HKPF.

2.9.5 All cable terminations shall be identified clearly for disconnection and reconnection.

2.10 Other Design Features

2.10.1 Permanent list is not allowed.

2.10.2 Permanent ballast is not allowed, unless it was agreed by GNC and HKPF.

2.10.3 The Vessel shall be designed and constructed so that there is no undue vibration in the hull structure and machinery.

2.10.4 Protective canvas coverfor storage of the Vessel shall be provided.

2.10.5 Hazard warning for the air propeller and duct guard shall be fitted.

Chapter 3 Hull

3.1 Structures of the Hull and Scantlings

3.1.1 The Vessel shall be designed and built as a rigid inflatable fully amphibious hovercraft, the total weight of which is supported by an air cushion generated by the lift system independent from the propulsion system. Surface effect craft with side walls immersed in water while the Vessel is on cushion are not acceptable. The Vessel shall provide seats for three (3) persons. The hull structure shall be constructed of marine grade Glass-reinforced plastic ("GRP") or equivalent, attached with full length inflatable sponsons surrounding the deck edges.

3.1.2 The Vessel shall be fitted with replaceable landing pads or skids to facilitate parking. The Vessel shall be designed to support the maximum weight on three-quarters of the supports of the landing pad. The landing pads or skids are to be aligned with the hull supporting structure, which shall be additionally stiffened where necessary.

The Vessel's design stresses and load (wave height versus speed), maximum acceleration considered and scantlings calculation, including internal structural members and skirt system, shall be designed according to the RO or RA rules, or ISO12215, or The Hovercraft Code or equivalent, in the latest version as at the Contract Date, unless the rules and regulations of the RO or RA specify that version of such rules and regulations as at the date of commencement of construction of the Vessel shall apply in relation to the relevant requirements specified therein. It shall be capable of withstanding stresses generated by wave impacts and other conditions in the operational environment. All material and build processes for GRP construction shall comply with one of the standards as stipulated in paragraph 2.2.2. Their selection shall recognise the craft through life cycle and service conditions for ease of repair in the event of hull damage.

3.1.3 Any openings in the hull and deck shall comply with the applicable RO or RA rules for watertight integrity if not otherwise specified by GNC or the HKPF at or prior to the kick-off meeting.

3.1.4 The hull design shall incorporate a bilge system which is capable of draining the cockpit in accordance with The Hovercraft Code or the requirements of the RO or RA, in the version as at the Contract Date unless the rules and regulations of the RO or RA specify that version of such rules and regulations as at the commencement of construction of the Vessel shall apply in relation to the relevant requirements specified therein.

3.1.5 The Vessel shall remain afloat when the Vessel is not on cushion. Watertight hatches shall be provided for the watertight compartments for ease of inspection.

3.1.6 The hull structure design loads shall be in accordance with the Vessel operational profile and The Hovercraft Code or equivalent.

3.1.7 Hull construction materials shall be new and of a type which has been certified by RO or RA.

3.1.8 The up-to-date records of the structural materials, with identification details, being used for Vessel construction shall be provided to GNC before and / or during the construction stage of the Vessel.

3.1.9 The Contractor shall carry out quality control throughout the construction of the Vessel by their quality control personnel. Quality control records shall be made available when requested by

GNC.

3.1.10 Strength shall be maintained by ensuring hull structural continuity of main members including bottom and deck girders and transverse web frames. Where the strength of a main structural member is impaired by cuts or interruptions in continuity, efficient means of compensation shall be fitted. Special care shall be taken in reinforcing the hull in way of the fenders and areas likely to experience slamming.

3.2 Construction / Fabrication of Hull and Skirt

3.2.1 General Workmanship

All materials and procedure for construction / fabrication of hull and skirt shall be approved by RO or RA prior to construction.

3.2.2 GRP Hull Construction

(a) Trunks, coamings, and deck cuts where applicable shall have radius corners as large as possible.

(b) Fittings and openings through decks and bulkheads for pipes and cables shall be properly designed to maintain watertight integrity, reduce transmission of heat, and to minimize transfer of machinery vibration and noise to the hull structure.

(c) Sharp corners shall be avoided.

(d) All decks, platforms and walking flats shall be sufficiently reinforced to prevent deflection that might be caused by an individual walking or standing on the deck and/or by structural flexure of the hull.

3.2.3 Structure fabrication and quality control regime

(a) Inventory of incoming material, consumables components and machinery;

(b) Traceability procedures for materials together with traceability identification codes which shall be serial numbered and indexed to the controlled manufacturing procedures;

(c) Lofting, cutting, fitting up, welding, forming and dimensions of structural components;

(d) Machining, measuring and inspection equipment maintenance and calibration;

(e) Finish surfaces and bolting;

(f) Procedures for non-conformance reporting and rectification of defects; and

(g) Design and manufacturing drawing control and procedures for revisions, updates and reissue of drawings.

3.2.4 Skirt

(a) The skirt shall be an open loop and segment type. The skirt materials shall have high resistance to ripping and sufficient strength in compliance with The Hovercraft Code or equivalent. For ease of maintenance, the segments shall be easily unbolted for replacement and the whole skirt system shall be accessible without having the Vessel lifted out of the parked position on a hard surface.

(b) The air cushion shall have sufficient depth to provide stable performance whilst going into wind and waves, as well as traversing higher obstacles within the design limits of the Vessel.

(c) Details of the skirt system with detailed dimensions and specifications shall be submitted to the RO or RA and GNC, for approval.

(d) The skirt shall be securely attached around its periphery the Vessel.

(e) The attachments of the skirt to the hull shall be of sufficient strength that no damage is caused to the hull attachment if the skirt material is ripped or snagged with sufficient force to

break the skirt connecting device.

(f) The retention approach of skirt approach shall comply with specifications of The Hovercraft Code or equivalent.

(g) The skirt attachment shall be designed to withstand the loading due to skip stops on land.

(h) Where the design of the skirt is such that the flexible edge is retained by the use of a pre-formed channel, only the bolted hull connection of the preform to the hull structure is considered.

(i) The construction and materials of the skirt shall also comply with The Hovercraft Code, or equivalent, in the latest version as at the Contract Date.

(j) The skirt system shall be such as to ensure adequate stability when hovering on the air cushion under all operating conditions. The skirt shall be designed according to the relevant requirements of The Hovercraft Code.

(k) In addition to the skirt fitted to the Vessels, the Contractor shall also provide four (4) complete shipsets of skirt upon the delivery of the Vessel as Contract Spare Parts. Please also see Schedule 1 of Part V.

3.3 Stability

3.3.1 The Vessel shall meet the stability requirements according to Chapter 11 Stability of The Hovercraft Code or equivalent, in the latest version as of the Contract Date. **[E]**

3.3.2 The skirt system shall be such as to ensure adequate stability as required according to the relevant requirements of The Hovercraft Code or equivalent.

3.3.3 When the Vessel is floating with the lift system not operating, the freeboard for the associated hovercraft types shall be not less than that required by The Hovercraft Code or equivalent.

3.3.4 Buoyancy tanks may be provided if required.

3.3.5 Final stability assessment result shall be delivered to GNC prior to the Official Sea Trial mentioned in Paragraph 1.8.2 of this Part VII.

3.4 Painting

3.4.1 Paints shall be of a fire-retardant marine quality and applied in accordance with the manufacturer's specification.

3.4.2 The volatile organic compounds ("VOC") content limits of the paints shall comply with the Hong Kong Air Pollution Control (Volatile Organic Compounds) Regulations CAP 311W.

3.4.3 The painting schedule shall be submitted for GNC's approval before commencement of work. The proposal shall contain a list and the detailed specification of the paint intended to be used. The dry film thickness of each coating shall be specified.

3.4.4 The Contractor shall guarantee all painting work for one (1) year against defects in materials and workmanship. At Delivery Acceptance the Contractor shall provide GNC with a letter of certification from the paint manufacturer, signed by qualified coating inspectors to certify that the paint has been applied under the paint manufacturer's quality control and in accordance with the manufacturer's requirements including, but not limited to, the surface preparation (blasting profile and water soluble salt content), surface temperature of the metal surfaces above dew point, atmospheric conditions, (temperature and relative humidity), dry film thickness and method of application.

3.4.5 The surface of a working deck shall be covered with hard wearing anti-slip paint. Details shall be discussed at the kick-off meeting.

3.4.6 A painting report shall be submitted to GNC upon completion of the work.

3.5 Console

3.5.1 The offered Vessel shall have one (1) console. The layout of the console shall be submitted for GNC's approval before any construction work on the console commences. To facilitate the efficient visualisation and inspection of the design of the console, the Contractor, apart from a drawing submission including layout plan, shall build a full size mock-up of the console to show the positions and arrangement of deck plates, seats, the ENE, and any other fixtures that may influence the ergonomics of the man machine interface, ease of accessibility for inspection and maintenance, for inspection, modification (if necessary) and confirmation by GNC and the HKPF.

3.5.2 The console shall be designed to deflect wind up and over the heads of the coxswain in both the seated and standing positions and to house the equipment required by the coxswain to control the Vessel.

3.5.3 The console's design shall be optimised ergonomically so that a coxswain (approximately 1.64 metres in height) can operate the controls and displays for extended periods, from both the seated and standing positions, without incurring unnecessary physical strain.

3.5.4 The control or displays of the following equipment shall be installed in the console and located in front of the coxswain in natural positions, with the highest priority devices being located in prime positions. Controls shall ideally be positioned between elbow and shoulder height. Instrument panels and display screens shall be located at or below sitting eye height. All controls and displays shall be operable when wearing normal uniform with foul weather gear and lifejacket and shall include:

(a) The position of engine throttle control acceptable to the HKPF shall be designed to ensure optimal accessibility and ergonomics. Details of the design shall be discussed at the kick-off meeting and agreed by the HKPF;

(b) The position of lift fan speed control lever acceptable to the HKPF shall be designed to ensure optimal accessibility and ergonomics. Details of the design shall be discussed at the kick-off meeting and agreed by the HKPF;

(c) Engine monitoring display panel;

(d) Engine start control;

(e) A magnetic compass fitted with an independent dimmer switch, installed on the top of the console in line with the coxswain's line of sight dead ahead;

(f) Electric horn;

(g) Police siren and flashing blue light control panel;

(h) Navigation lights, search lights and flood lights switch panel;

(i) GPS receiver;

(j) Fuel tanks level gauge, if possible;

(k) Radio communication controls and microphone; and

(l) Loudhailer control unit and microphone.

3.5.5 Controls, Displays and Equipment

(a) All the controls, displays and equipment shall be waterproof, shockproof and suitable for external marine use;

(b) All indication lights, illumination of instrumentation gauges and panel lighting shall be fitted with dimmers for day and night time operation;

(c) A space for stowage for toughpad shall be provided. Size of the space and power point to be discussed in kick-off meeting;

(d) Lockers shall be provided, if space permits, to allow for the watertight storage for officer's

equipment. The console and locker(s) shall be designed to ensure easy access for the maintenance and repair of equipment mounted, installed or stored therein;

(e) The arrangement shall be designed to protect the crew and persons on board from injury inflicted by the console and the equipment installed thereon;

(f) Sufficient legroom shall be provided to obviate the risk of impact injuries occurring during rough weather or hard manoeuvres in both the seated and standing positions;

(g) A waterproof black / grey cover shall be provided to cover the console down to deck level when the Vessel is not in use. Details of the design shall be discussed at the kick-off meeting and agreed by the HKPF;

(h) Vibration absorbing mats shall be provided on the deck. Details shall be discussed at the kick-off meeting and agreed by the HKPF; and

(i) In addition to controls, displays and equipment in relation to the propulsion and lift engines fitted to the console, the Contractor shall also provide one (1) complete Vessel set of this equipment upon the delivery of the Vessel as Contract Spare Parts, including cabling, control panels, visual instruements, etc. Please also see Schedule 1 of Part V.

3.6 Lockers / Void Spaces / Air Pipes

3.6.1 Lockers / Void Spaces

(a) Watertight lockers / storage acceptable to the HKPF shall be provided as far as possible, if the space permits;

(b) The location and dimensions of lockers or other storage acceptable to the HKPF shall be discussed at the kick-off meeting and agreed by the HKPF; and

(c) Lockers or other storage acceptable to the HKPF shall be provided for one set of emergency repair tools and all lifejackets onboard.

3.6.2 Air pipes shall be fitted to all tanks, cofferdams, void spaces, tunnels and other compartments which are not fitted with alternative ventilation arrangements, where applicable.

3.6.3 The design of lockers or other storage, or void spaces and their mounting facilities, shall be approved by GNC and the HKPF during the kick off meeting. Lockers or other storage shall be ready in the mock-up for inspection before finalisation.

3.7 Deck, Seating and Attachment Systems

3.7.1 High quality upholstered bench seating for three (3) persons, anti-vibration deck covering and handrails shall be provided to reduce the risk of impact injuries and long-term health impairment to both coxswain and boarding officers resulting from the harsh maritime environment in which the Vessel will operate.

3.7.2 The seats shall be designed to prevent occupants from falling or being thrown onto the deck or overboard, to optimise body posture thereby minimising the potential for spinal or other injuries and to mitigate the potentially harmful forces to which the Vessel and crew conducting the type of operations specified in Paragraph 1.2.1 according to the operational profile specified in Paragraph 2.7 of this Part VII may be subjected.

3.7.3 Basic requirements of the seats:

(a) Materials of upholstery: Water resistant materials such as fire retardant foam / reinforced nylon laminated neoprene / heavy duty Cordura laminate.

(b) Protective covers: Covers shall be provided to protect all of the seats from rain and ultraviolet radiation when not in use.

3.7.4 Suitable handrails and grips, coated with appropriate anti-slip material, shall be provided at the console and at other locations around the Vessel to enable operators to move safely around the

Vessel at all times.

3.7.5 All working flat surfaces where personnel may step shall be coated with an appropriate hard wearing anti-slip material.

3.7.6 The designs of the fixtures, fittings and finishing specified, shall be discussed during the kick-off meeting and drawings shall be submitted to GNC and the HKPF within one month from the date of the kick-off meeting for approval.

3.8 Gunwale Fittings

3.8.1 All gunwale fittings such as cleats and bollards shall be designed to minimise the risks of line tangling or snagging. All deck level tie-down points shall be flush fitting or removable to minimise trip hazards.

3.9 Stern Area

3.9.1 The stern area shall be designed to provide safe and easy access to the engines and / propulsion system for routine checking and troubleshooting including while the Vessel is underway at sea.

3.9.2 All machinery shall be protected by a suitable guard that complies with The Hovercraft Code or an equivalent. Details of the design shall be discussed at the kick-off meeting and submitted to GNC for approval before the completion date stipulated in Annex 2 to this Part VII.

3.10 Anchor, Chains and Strong Points

3.10.1 The Vessel shall be equipped with one (1) aluminium or stainless steel anchor complying with The Hovercraft Code or equivalent, if applicable. The suitable swivel, shackles and secured stowage shall be provided by the Contractor.

3.10.2 Two (2) braided nylon warps complying with The Hovercraft Code or equivalent for anchoring and towing shall be provided by the Contractor in a suitable secure stowage to prevent movement of the stored anchor whilst the Vessel is in operation. Details shall be discussed at the kick-off meeting and agreed by the HKPF.

3.10.3 Two (2) nylon warps complying with The Hovercraft Code or equivalent for mooring shall be provided by the Contractor in a suitable secure stowage. Details shall be discussed at the kick-off meeting and agreed by the HKPF.

3.10.4 The strong points shall be designed and installed with sufficient safety factor to prevent material yield of the strong points or surrounding structures to which they are attached, whether welded or bolted. Calculation of the horizontal load shall be in accordance with the requirements of ISO 15084, The Hovercraft Code or quivalent, in the version as at the Contract Date unless the rules and regulations of the RO or RA specify that version of such rules and regulations as at the commencement of construction of the Vessel shall apply in relation to the relevant requirements specified therein. The following strong points with approved design by RO or RA shall be provided:

(a) Anchoring / towing point forward (port and starboard);

(b) Mooring point aft (port and starboard); and

(c) Lifting strong points for a four-point lift.

3.10.5 Devices for Lifting the Vessel

(a) The Vessel shall be provided with two (2) means of lifting for docking, storage, inspection and maintenance purposes, designed for use with the fixed knuckle cranes and telescopic cranes onboard vessels, travel hoists and truck mounted cranes:

(1) 4-Point Lifting Method

The Vessel shall be designed with 4 (four) strong point lifting attachments permanently fitted to the hull. A spreader frame shall be provided if the bending stress induced during lifting exceeds the Vessel ’s permissible tolerances or if the lifting

wires / strops would otherwise foul the radar frame or equipment fitted thereto. The design of the lifting attachments, wires / strops and spreader, etc., shall be approved by the RO or RA complying with Hong Kong Merchant Shipping (Local Vessels) (Works) Regulation and shall match, where practical, the lifting facilities at the HKPF's operational bases.

(2) Lifting Sling Method

The Vessel shall be designed to allow the Vessel to be hoisted ashore by means of lifting slings around the hull with permanent markings at the designated lifting points. The hull structure shall, if it is necessary, be strengthened and approved by the RO or RA. The locations at which the slings are to be positioned shall be marked clearly.

(b) The lifting points and locations shall be designed and installed with sufficient safety factor to prevent material yield of the strong point or surrounding structure in a welded condition. Detailed drawings of the lifting arrangements shall be approved by the RO or RA.

3.10.6 All the lifting devices / accessories shall be designed in according with either The Hovercraft Code, The National Standard of Hovercraft or equivalent. All devices and accessories shall be certified by the RO or RA and in accordance with the Schedule 1 of CAP 548I MERCHANT SHIPPING (LOCAL VESSELS) (WORKS) REGULATION prior to delivery. The 4-point lifting and lifting sling method designs shall be discussed at the kick off meeting and agreed by GNC and the HKPF. To avoid the need for costly and unnecessary alteration or modification of existing equipment, the Contractor shall, prior to any construction, submit detailed drawings of both methods so that the HKPF can check dimensional compatibility with its existing lifting facilities.

3.11 Cradles

3.11.1 The Contractor shall supply each of the Vessel with a suitably designed metal slipping cradle with appropriate safety features on which the Vessel can be slipped ashore and tied down during tropical cyclones. The cradle shall have stoppered wheels and shall be designed to be towed by plant within the HKPF's operational base compounds and be steerable for manual positioning. This cradle is not required for use on public roads. Details shall be discussed at the kick-off meeting. The design shall be submitted to GNC for approval.

Chapter 4 General Arrangement

4.1 General Provision

4.1.1 Unless otherwise specified in this Part VII, the Conceptual General Arrangement Plan given in Annex 10 to this Part VII only serves as a reference. It is a reference drawing to illustrate how the Tender requirements could be fulfilled, and in no way a mandatory layout of the Vessel. The Contractor is encouraged to produce its own design which meets the Overall Specifications including all requirements of Technical Specifications in this Part VII. This Conceptual General Arrangement Plan shows a reference layout of the accommodation and compartment arrangement of the Vessel.

4.1.2 The Vessel shall be designed and constructed to be capable of carrying all crew and police officers of a total of three (3) persons. **[E]**

4.1.3 The Tenderer shall submit the Preliminary General Arrangement Plan in Schedule 7 of Part V for Government's consideration at the tendering stage. During the design and construction of the Vessel, the Contractor shall submit a detailed General Arrangement Plan for GNC's approval and acceptance.

4.1.4 It is a contractual requirement that ALL furniture, equipment and facilities, fixtures and fittings, including outfitting of the Vessel that are described in this Part VII, together with their requirements for design and installation standards that are stipulated in this Part VII shall be

included in the completed "As- built" Vessel delivered to the Government.

4.1.5 The Tenderer should note that the requirements given in this Part VII (the TS) are in addition to the requirements of RO or RA and shall be met by the design and construction of the Vessel.

4.1.6 All interior decks shall be covered by non-slip vinyl sheet flooring with the colour to be approved by GNC and HKPF.

4.1.7 All controls, electrical equipment, high-temperature parts and pipelines, rotating assemblies or other items onboard shall be properly placed, protected and/or insulated to maintain comfort and reduce the risk of injury.

4.1.8 All windows shall be of RO or RA approval type.

4.1.9 All fittings and hardware installed onboard the Vessel (e.g. screws, hasps, hinges, handles, sliding bolts, coat hooks, ceiling lights, bulkhead mounted lights, etc.) shall be of a high-quality stainless steel or other metals with chrome finish provided that galvanic corrosion due to contact of dissimilar metals shall not be permitted. They shall be properly installed in all spaces as directed by GNC.

Chapter 5 Fire Safety Equipment

5.1 General Provisions

5.1.1 The fire-fighting equipment ("FFE") shall comply with the RO or RA requirements, the Hovercraft Code or equivalent, in the latest version as at the Contract Date.

5.1.2 FFE Plan shall be submitted to RO or RA and GNC for approval.

5.2 Fire-fighting Equipment

5.2.1 Two (2) fixed Pyrogen canisters shall be provided and situated in each engine bay.

5.2.2 Two (2) sets of portable extinguishers shall be provided with holding racks.

Chapter 6 Lifesaving Appliances and Arrangements

6.1 General Provisions

6.1.1 The life-saving appliances ("LSA") shall comply with the RO or RA requirements, or The Hovercraft Code or equivalent, in the latest version as at the Contract Date.

6.1.2 LSA Plan shall be submitted to RO or RA and GNC for approval.

6.2 Lifesaving Equipment

6.2.1 The LSA shall include a lifebuoy with marker light and a rescue quoit with line attached. The lifebuoy shall be marked "Police" in both English and Traditional Chinese together with the Vessel's name and reflective tapes.

6.2.2 Three (3) self-inflatable life jackets of SOLAS approved type shall be provided.

Chapter 7 Machinery

7.1 General Requirements

7.1.1 The Contractor shall note that the Vessel is for use in Hong Kong and it is desirable that the main engines and any other machinery offered by the Contractor are those at present commonly used by similar craft operating in Hong Kong Waters, and that they have good support for spare parts and after sale services locally in Hong Kong. The agents/distributors and supporting service provider of major machinery equipment specified in Schedule 6 should be provided during kick-off meeting to HKPF and GNC for discussion.

7.1.2 The Vessel shall be powered by power systems providing propulsion (thrust) and lift to deliver the Contract Speed as stated in Paragraph 2.3 of this Part VII. The propulsion (thrust) systems shall be powered by four-stroke petrol spark ignition engine of adequate power. The lift systems shall be powered by other four-stroke petrol spark ignition engine or an electric motor.

7.1.3 The specifications of the both power systems shall comply with the requirements of The Hovercraft Code or equivalent in the version as at the Contract Date.

7.1.4 The design and installation of machineries shall comply with the Hovercraft Code or equivalent, in the version as at the Contract Date.

7.1.5 The routine engine check service (including oil change) for onboard engines, gearboxes and electric motor shall be provided by the Contractor within the warranty period.

7.1.6 Training shall be provided by the Contractor including providing video for the procedure for engine change, fan duct change with their alignment adjustment.

7.1.7 The Contractor shall be responsible for ensuring the correct installation and setting up of the power systems including the choice of propulsion fan and lift fan in accordance with the manufacturer's recommendations. The proposed propulsion fan and lift fan shall comply with requirements of The Hovercraft Code or equivalent, in the version as at the Contract Date.

7.1.8 The Vessel shall be equipped and fitted with all machineries described each complying with the specifications set out in this Part VII for such machinery. The Spare Parts to be provided shall be of the same model as supplied for the Vessel and shall equally comply with all specifications set out in this Part VII.

7.1.9 A lift-up engine or electric motor cover shall be provided to permit instant access to all components within the engine bay. Sufficient space in the vicinity of all machinery for local operation, inspection and routine maintenance for all the machinery shall be provided. Procedures and sequences for complete removal of the major items such as the engines, gearboxes, fuel oil tanks etc. shall be carefully designed to enable their removal from the Vessel for maintenance in a practicable manner so to avoid the need for the deck or frame to be cut.

7.1.10 The electrical cables, piping for fuel and hydraulic oil lines run between the console, fuel tanks and the machinery shall be suitably designed for ease of maintenance. They shall be supported properly to prevent chafing and unnecessary tension.

7.1.11 Each power system shall include the following accessories:

(a) 12V electrical alternator and remote starting control;

(b) Dead-man's switch and emergency cut-off;

(c) Engine protection system as required by engine manufacturer, with audio and visual warnings at the console; and

(d) At least one (1) alternator incorporated into one of the engine powered systems for battery charging.

7.1.12 The Contractor shall supply the Vessel with a comprehensive hovercraft information system for display on the monitors located at the console. The information shall include but not be limited to the following:

(a) Engine rpm;

(b) Engine running hours;

(c) Oil temperature and pressure;

(d) Fuel level and range until the fuel tank is empty;

(e) Battery voltage;

(f) Course and speed;

(g) Engine faults and notification alarms; and

(h) Any other data which the supplied system and engines are capable of generating.

7.1.13 In addition to the complete set of engine including fan for propulsion (trust), fitted to the Vessel, the Contractor shall also provide two (2) shipsets of engine including fan for propulsion (trust), upon the delivery of the Vessel as Contract Spare Parts. Please also see Schedule 1 of Part V.

7.1.14 In addition to the complete set of engine including fan for lift, fitted to the Vessel, the Contractor shall also provide two (2) shipsets of engine including fan for lift, upon the delivery of the Vessel as Contract Spare Parts. Please also see Schedule 1 of Part V.

7.2 Propulsion (thrust) and Lift System

7.2.1 Air cushion

The Vessel shall be supported during operation on air cushion of low-pressure air contained under the craft, by a skirt system constructed from the material specified in Paragraph 3.2 in this Part VII. The skirt allows the craft to lift and will allow obstacles to pass into the air cushion and under the craft with minimum drag.

7.2.2 Propulsion and Lift Power Sources

The Vessel shall be operated by the propulsion (thrust) and lift systems. The propulsion (thrust) system shall be driven by an petrol engine via the propulsion fan, while the lift system shall be driven by either a independent petrol engine or an electric motor via the lift fan. Individual fan speeds can be controlled separately to assist control particularly during slow manoeuvres.

7.2.3 Propulsion Fan and Lift Fan

(a) The Vessel shall be equipped with one (1) propulsion fan as part of the propulsion (thrust) system and one (1) lift fan as part of the lift system;

(b) Air for the cushion shall be provided by the lift fan, which shall be constructed with composite blades/fins. In the event of blade/fin damage, the blade/fin should be capable of being replaced individually or, as a set. The uniformity of the blades/fins shall be such that no balancing of the complete fan is necessary provided that all blades/fins are of an identical length. The lift fan shall be installed in accordance with the manufacturer's recommendations;

(c) Propulsive thrust shall be provided by the manufacturer recommended fan contained within a duct fitted with an intake mesh guard. In the event of blade/fin damage, the blades/fins may be replaced individually or, as a set. The uniformity of the blades/fins shall be such that no balancing of the complete fan is necessary as long as all blades/fins are of an identical length. The propulsion (thrust) fan shall be installed in accordance with the manufacturer's recommendations; and

(d) The propulsion and lift fan systems shall comply with The Hovercraft Code or equivalent, in the version as at the Contract Date.

7.3 Rudder System

7.3.1 Directional control of the Vessel shall be provided by an air rudder type manoeuvring system, which consists of vertical rudders abaft of the propulsion fan. The rudders can be controlled

from the steering console, allowing the craft to manoeuvre and turn in its own length. The rudder system shall comply with The Hovercraft Code or equivalent, in the version as at the Contract Date.

7.4 Engine Compartment

7.4.1 All engine compartments shall have weathertight hatches / covers / casings, so as to allow optimal reach for maintenance and to facilitate visual checking of the engines and other main components of the Vessel.

7.4.2 Arrangements shall provide sufficient air to the engines and shall provide adequate protection against damage, as distinct from deterioration, due to ingress of foreign matter as well as to prevent over heating (specific operating environment, i.e. Hong Kong).

7.5 Fuel, Lubricants and Fluid

7.5.1 The fuel oil for the engine(s) shall be supplied from one or more fuel oil tank(s). The capacity of the fuel tank(s) shall provide endurance for the Vessel of two (2) hours at Contract Speed as specified in Paragraph 2.7 of this Part VII. The Contractor shall design and locate the fuel oil tank in accordance with the Rules of RO or RA, The Hovercraft Code or equivalent, in the version as at the Contract Date.

7.5.2 Fuel filters shall be provided on the suction side of the fuel pump. The system design and filtration systems shall be approved by the engine manufacturer.

7.5.3 The tanks shall be hydrostatically tested as required by an approved standard and connections shall be proven tightness.

7.5.4 The Contractor shall provide the initial fills of fuel oil, lubrication oil, coolant, and hydraulic fluids using fluids and additives prescribed by the engine manufacturer. The Contractor shall provide a summary listing of all fluids and quantities used.

7.5.5 All materials used in the fuel system shall be resistant to deterioration by its designated fuel and to other liquids or compounds with which it may come into contact under normal operating conditions, e.g. grease, lubricating oil, bilge solvents and sea water.

7.5.6 Fuel Oil Tank(s):

(a) Fuel oil tank(s) shall be arranged to allow the Vessel to operate at acceptable trim in all operating conditions and with consideration for the requirements for good static and running trim, ensuring unobstructed visibility. The Vessel shall be designed and built with one or more fuel tank(s) to provide fuel for the Vessel's engines. The tank(s), if more than one, shall be interconnected;

(b) The location of the fuel oil tank(s) shall not render the Vessel being non-compliant with the requirements in this Part VII;

(c) The fuel oil tank(s) shall sustain the loads due to the mass of the fully filled and partially filled tank(s) with due consideration given to sloshing and accelerated forces due to the Vessel's movements at all speeds at sea, without damaging the tank and ship structure;

(d) A quick closing valve or cock shall be fitted in the fuel supply line pipe as close as possible to the fuel tank (or each fuel tank if there is more than one fuel tank) or a spill proof fuel pipe connector which allows rapid disconnection of the fuel supply in emergency; and

(e) Provisions to the fuel oil tank:

(1) A tank contents gauge shall be fitted in the console. A level gauge in litres and inspection hole shall be provided for each tank;

(2) Suitable provision such as drip trays shall be made for collecting any oil discharge;

(3) The tanks shall be designed and installed to prevent water from being trapped on the exterior surface;

(4) Tank drain(s) and earthing protection shall be provided;

(5) The fuel oil tank shall be fitted with anti-condensation ventilating device and that complies with The Hovercraft Code or equivalent, in the version as at the Contract Date;

(6) Water-in-fuel sensor(s) shall be provided; and

(7) Except the electric wires for the fuel oil tank level sensor(s), no other shall pass through any fuel tank. Ventilation for the fuel tank shall comply with national or other acceptable industrial standards.

7.5.7 Adequate maintenance access opening shall be provided for on board routine checking and replacement fuel tank sensors (fuel tank capacity sensor, fuel tank temperature sensor) without the need of removal hull structure or lifting out fuel tank from vessel.

7.5.8 Fuel tank shall be easily removed for hot work or the deck fittings should be bolt type as far as practical.

7.6 Bilge System

7.6.1 The Vessel shall be fitted with a bilge system complying with The Hovercraft Code, or equivalent, in the version as at the Contract Date.

7.6.2 A bilge audible and visual alarm panel shall be fitted in the console, with float switches to be provided, to continuously monitor and give visual warning of high bilge water level within the engine bay or fuel compartment even when the vessel is afloat and unmanned for the alert of the persons ashore.

7.6.3 Details of the bilge system design shall be discussed at the kick-off meeting and submitted to the GNC for approval before the completion date stipulated in Annex 2 to this Part VII.

7.6.4 The Vessel shall be designed and constructed to minimise the potential for the accidental overboard discharge of pollutants (oil, fuel, etc.).

Chapter 8 Electrical System

8.1 General Requirements

8.1.1 All the electrical equipment and installation shall meet the RO or RA requirements, The Hovercraft Code, or equivalent, in the latest version as at the Contract Date.

8.1.2 Engine alternator(s), at idle conditions, shall provide sufficient power to maintain the battery charged.

8.1.3 All electrical equipment, fittings, instruments, switches, cables, insulation, sheathing, circuit breakers, rating standards and their installations shall comply with the latest Regulations of the International Electro-technical Commission (hereinafter referred to as IEC), Electrical Installations in Ships. The electrical system shall be an insulated two-wire Direct Current ("D.C.") system. The hull shall not be used as a current-carrying conductor.

8.1.4 Protective devices such as circuit breakers or fuses shall be provided at the source of power, e.g. the switchboard, to interrupt any overload current in the circuit conductors before heat can damage the conductor insulation, connections or wiring-system terminals.

8.1.5 The electrical equipment shall be capable of operating simultaneously without causing interference to any electronic equipment including the compass. The system shall provide sufficient power to operate all installed electrical systems using a 12-volt D.C. system.

8.1.6 The Vessel shall be supplied with a comprehensive wiring diagram schematic. The Contractor shall submit a layout plan showing the exact location of all of the Equipment. All Equipment shall be easily and safely accessible for inspection and maintenance.

8.1.7 Essential drawings and detailed particulars (such as the rating and capacity, type of all electrical equipment as well as the wiring, circuit breakers, lighting and sockets) shall be submitted for the GNC's approval before the completion date stipulated in Annex 2 to this Part VII.

8.1.8 Detailed wiring diagrams of the complete supply and distribution network, including wire size, insulation and sheathing shall be approved by the RO or RA when required by the rules or equivalent and submitted for the GNC's approval before the completion date stipulated in Annex 2 to this Part VII.

8.1.9 All Equipment shall be easily and safely accessible for inspection, maintenance and ventilation. Shields shall be installed as necessary to protect electrical equipment from drips or spray resulting from normal operation of or damage to, piping systems. Insofar as practicable, equipment shall be located to reduce the possibility of damage or malfunction caused by partial flooding of the space in which the equipment is located and to protect the equipment from accidental physical damage.

8.1.10 All 12-volt D.C. equipment shall function over a voltage range of 10.5V to 15.5V at the battery terminals.

8.1.11 The length and cross-sectional area of conductors in each circuit shall be such that the calculated voltage drop shall not exceed 10% of the nominal battery voltage for any appliance when every appliance in the circuit is switched on at full load.

8.1.12 The Contractor shall submit a layout plan showing the exact locations of the Equipment.

8.1.13 All Equipment installed shall be accompanied by operation and maintenance manuals.

8.1.14 The Equipment installation standards shall serve to enhance safety and not present hazards to the operators, e.g. all metal panels exposed to the operator shall be grounded properly. Warnings of any potential hazards shall be displayed in both English and Traditional Chinese, or with universally recognisable labels.

8.1.15 Complete electrical system schematic diagram and all electrical equipment wirings diagram of the vessel shall be provided, and complete engine electric wiring and schematics diagrams, engine gauges and sender wiring diagrams, engine starting and shutdown system schematic diagram, etc. shall also be provided.

8.2 Batteries

8.2.1 At least one (1) group of 12-volt maintenance-free batteries shall be provided for the engines and shipboard services.

8.2.2 The capacities of the batteries shall be sufficient complying with the requirements of the RO or RA, The Hovercraft Code or an acceptable standard.

8.2.3 A separate battery shall be dedicated to the emergency services (e.g. radio communications and signalling, emergency and navigation lights) as required and in accordance with the RO or RA requirements, The Hovercraft Code or equivalent.

8.2.4 The engine-driven alternator(s) shall be able to charge the batteries and to provide 12V D.C. power to the shipboard services.

8.2.5 Batteries shall be permanently installed in compliance with the RO or RA requirements or other acceptable standards in a dry, ventilated location above the anticipated bilge water level.

8.2.6 In consideration of the intended operational role of the Vessel, the batteries shall be installed in a manner that restricts their movement horizontally and vertically, complying with the requirements of the RO or RA, The Hovercraft Code or equivalent.

8.2.7 Batteries installations shall be designed, installed and protected so that metallic objects cannot come into unintentional contact with any battery terminal.

8.2.8 Batteries, as installed, shall be protected against mechanical damage at their location or within their enclosure.

8.2.9 Batteries shall not be installed directly above or below a fuel tank or fuel filter.

8.2.10 Any metallic component of the fuel system within 300 mm above the battery top, as installed, shall be insulated electrically.

8.2.11 Battery cable terminals shall not depend upon spring tension for mechanical connection.

8.2.12 All circuits (with the exception of those required for starting the engines and powering navigation lighting, electronic devices with protected memory and protective devices such as bilge pumps and alarms, which are to be protected individually with a circuit breaker or fuse as close as practical to the battery terminal) will be connected to the supply system voltage in a readily accessible location through a master battery disconnection switch, installed at or as close as possible, to the positive conductor from the battery, or group of batteries.

8.2.13 Renewal of batteries can be directly carry out on board without the need of remove /modify of battery cabinet and battery rack. Adequate accessible maintenance space shall be available on top of each battery for on board routine checking battery voltage/current, battery terminal inspection and maintenance without the need of removal of all obstructive batteries.

8.2.14 All batteries of the vessel shall be automatically kept fully charge without the need of crew to operate selector switch for regular select which battery bank being charged.

8.2.15 Each battery bank shall be labelled for identification of services to be powered up.

8.3 Distribution Network

8.3.1 12V D.C. services shall be supplied from the switchboard in the console through a 2-wire insulated system to the following items:

(a) Navigation light control panel and navigation lights;

(b) Horn;

(c) General lighting;

(d) Compass light;

(e) Instrument panel in the console;

(f) Hand-held searchlights;

(g) Siren;

(h) Electric bilge pumps;

(i) Blue flashing light; and

(j) All other navigational and electronic equipment (as applicable).

8.4 Cables

8.4.1 No electrical equipment, components or cables shall run through or be installed inside the petrol tank compartments.

8.4.2 Cables that are not sheathed shall be supported throughout their length in conduits, cable trunking, or trays, or by individual supports at maximum intervals of 300 mm.

8.4.3 Sheathed cables and battery cables to the battery disconnection switch shall be supported at maximum intervals of 300 mm, with the first support not more than one metre from the terminal. Other sheathed cables shall be supported at maximum intervals of 450 mm.

8.4.4 Conductors which may be exposed to physical damage shall be protected by sheaths (armoured cables), conduits or other equivalent means. Cables passing through bulkheads or structural members shall be protected against damage to insulation by chafing.

8.4.5 The metallic sheathing, armour or braid of cable, shall be earthed properly at both ends. All bare terminals shall be insulated properly with approved cable insulators.

8.4.6 Wiring shall run along conduits with openings and be secured in such a manner as to allow easy

maintenance. The cable penetrations at the openings of watertight compartments or deck shall comply with the requirements of the RO or RA, The Hovercraft Code or equivalent. The opening shall be at uppermost part of the bulkhead as far as practicable.

8.5 Overcurrent Protection

8.5.1 A manually reset trip-free circuit-breaker, or a fuse, shall be installed within 200 mm of the source of power for each circuit or conductor in the system or, if impractical, each conductor shall be contained within a protective covering, such as a sheathing conduit or cable trunking, for its entire length from the source of power to the circuit-breaker or fuse.

8.5.2 The voltage rating of each fuse or circuit-breaker shall not be less than the nominal circuit voltage. The current rating shall not exceed the value for the conductor of smallest diameter in the circuit.

8.6 Switchboard (Panel Board)

8.6.1 Switchboards or panel boards shall be installed in such a way that the control elements, indicating instruments, circuit-breakers and fuses are readily accessible. The terminal side shall be accessible.

8.6.2 Connections and components on panel-boards shall be in locations protected from the expected conditions in conformity with IEC 60529:

(a) IP 67 as a minimum, if exposed to short-term immersion;

(b) IP 55 as a minimum, if exposed to splashing water; and

(c) IP 20 as a minimum, if located in protected locations inside the Hovercraft.

8.6.3 Panel-boards (switchboards) shall be marked permanently with the nominal system voltage.

8.7 Receptacles / Sockets

Receptacles / sockets installed in locations subjected to rain, spray or splashing shall have a minimum protection of IP 55 (IP 66 recommended), in accordance with IEC 60529 when not in use, e.g. protected by a cover with an effective weatherproof seal, the cover of the socket shall be UV stabilized, chemically and impact resistant.

8.8 Lighting

8.8.1 All lighting, including the navigation lights, shall be equipped with LED bulbs or equivalent, and digital switching.

8.8.2 The arrangements and positioning of the lighting shall be discussed at the kick-off meeting and shall be agreed by the HKPF.

8.9 Navigational and Signalling Equipment

8.9.1 Navigation Lights:

(a) Navigation lights shall comply with the requirements specified in the International Regulations for Preventing Collisions at Sea 1972 as amended ("COLREG");

(b) The lights shall be controlled from the control and alarm panel at the console. Each navigation light circuit shall be provided with a switch, protection fuse, indicating lamp and alarm;

(c) A dimmer(s) for the panel indication lights, buzzer stop and lamp test buttons shall be fitted;

(d) Navigation light circuits shall be independent of any other electrical circuits. There shall be two (2) separate power supply systems to the distribution board;

(e) The following navigation lights shall be provided together with double-pole circuit-breaker:

(1) Port side light;

(2) Starboard side light;

(3) Stern light;

(4) Masthead light;

(5) Anchor light;

(6) Police blue light; and

(7) The air-cushion Vessel when operating in the non-displacement mode shall, in addition to the lights prescribed in Rule 23 in COLREG, exhibit an all-round flashing yellow light.

8.9.2 Type Approval Certificates for all navigation lights shall be submitted prior to Delivery Acceptance.

8.9.3 The Contractor shall provide the following signalling equipment of a type approved by the HKPF:

(a) One (1) radar reflector;

(b) One (1) siren; and

(c) One (1) horn.

8.10 Lightning Protection

8.10.1 The Vessel shall be fitted with a lightning protection system acceptable to RO or RA to protect the personnel on board and the electronic equipment installed on board.

8.10.2 The methodology and working principles of lightning protection shall be submitted to GNC for approval prior to installation.

8.11 Searchlight

8.11.1 The Contractor shall supply two (2) high-powered hand-held white LED searchlights. These shall be connected to sockets on board with coiled extension cables of appropriate lengths. Sockets shall be installed on both the port and starboard sides of the console.

8.11.2 Weathertight facilities for storing the hand-held searchlights shall be provided. The type of searchlight, the length of the extension cables, the positioning of the sockets and the stowage shall be discussed at the kick-off meeting and shall be agreed by the HKPF.

8.12 Floodlights

8.12.1 Independently controlled high-powered white floodlights shall be supplied to cover the fore and aft decks and both sides of the Vessel.

8.13 Driving Lights

8.13.1 The Vessel shall be fitted with appropriate front mounted forward facing “driving lights” (having a similar use and function as vehicle headlights) for illumination of obstructions when navigating at night over beaches / mudflats or uneven terrain.

Chapter 9 Electronic Navigational Equipment

9.1 Overview Requirements

9.1.1 The Contractor shall supply, deliver, install, commission, conduct trial test and provide warranty services for all of the Electronic Navigational Equipment and systems, intercommunication system, public address system, siren and external broadcasting system, international VHF radio, lightning protection, helmet compatible headgear, antennae and instruments and controls

specified in this Chapter 9 on the Vessel's consoles (collectively, "Electronic Navigational Equipment" or "ENE") and in accordance with all requirements specified in this Chapter 9.

9.1.2 Main units of the ENE shall be installed inside an equipment compartment(s) suitably protected from the weather, environment and sea spray while the associated control panels and displays will be flush mounted and/or recessed in console panels with appropriate watertight sealing. All designs and installation/mounting proposals shall be approved by the HKPF prior to the commencement of any such work.

9.1.3 In addition to the submission of a layout plan to the GNC and COMMS, to facilitate the optimal ergonomic design, user-friendliness, effectiveness and easy accessibility for inspection and maintenance of the console, the Contractor shall build a full size mock-up console as specified at Paragraph 3.5 of this Part VII for approval and comments from the GNC and COMMS. This mock-up console shall show the positions and arrangement of the actual ENE components and other equipment and controls on the console panel before construction and installation.

9.1.4 The Contractor shall, upon COMMS's request, submit a block diagram showing the conceptual connections between the ENE as specified in this Part VII for evaluation.

9.1.5 In addition to all the ENE that the Contractor is required to provide for each Vessel under Chapter 9 of this Part VII, the Contractor shall also provide one (1) complete shipset of this equipment upon the delivery of the Vessel as Contract Spare Parts, including cabling, control panels, gauges etc. Please also see Schedule 1 of Part V. In the event that any equipment is substituted during the Contract Period, the Contractor shall also supply one (1) sets of the substituted equipment, as spare parts.

9.1.6 All the Electronic Equipment onboard the Vessel and spare parts shall have local technical support and maintenance services in Hong Kong upon the completion of the Warranty Period.

9.1.7 The Contractor shall submit design description, schematic diagrams, hardware and software specifications, installation drawings and integration design including but not limited to the Electronic Equipment specified in Chapter 9 of this Part VII to HKPF for approval within the time specified by the HKPF and prior to the commencement of any such work during design stage.

9.1.8 Upon receipt of a request from the HKPF, the Contractor shall alter or adjust or modify any of the deliverables as specified in Paragraphs 9.1.1 and 9.1.2 of this Part VII to the satisfaction of the HKPF without causing any delay to the Implementation Plan or such other time requirements set out in the Contract, at no additional cost to the Government.

9.2 General Requirements

9.2.1 All ENE shall be marine type and comply with the relevant regulations of the SOLAS, IEC and the International Telecommunications Union recommendations in the International Radio Regulations ("ITU-R"), unless explicitly stated otherwise. They shall comply with all relevant IMO recommendations on performance standards and operational features. All radio communications equipment, including radars and radios, shall also comply with the requirements of the Office of the Communications Authority ("OFCA") of the HKSAR.

9.2.2 The Contractor shall observe and adopt the International Commission on Non-Ionizing Radiation Protection ("ICNIRP") Guidelines and the Code of Practice issued by OFCA of the HKSAR on the limits of exposure to radio frequency electromagnetic fields in the frequency range from 100 kHz to 300 GHz for the protection of operators, workers and the public against Non-Ionizing Radiation ("NIR") hazards, so as to provide a safe and healthy working environment under all normal conditions. In case of multiple simultaneous exposures, the combined effect of such exposure shall also be assessed in accordance with the ICNIRP Guidelines.

9.2.3 The Contractor shall warrant that all the ENE and materials used, irrespective of whether they are in operation or not, shall comply with the health and safety standards adopted by the World Health Organization in particular in relation to all harmful radiation. The Contractor shall also disclose in writing the existence of any radio frequency radiation hazard emitted from the

Equipment, which is harmful to human beings under normal operating conditions, by the safety standards adopted by ICNIRP, American National Standards Institution ("ANSI"), or other equivalent national or international standards.

9.2.4 All ENE shall be suitable for round-the-clock operation on the Vessel. If required, Equipment displays shall have adjustable brightness levels and be suitable for viewing under different brightness conditions at sea, including under direct sunlight, day time, dusk, dawn and nigh time, without causing eye-strain, glare and / or discomfort. Equipment control keys and buttons shall be suitably back-lit with adjustable brightness levels to aid operation in the dark without causing eye-strain, glare and / or discomfort.

9.2.5 Design Standards

(a) Environmental Conditions:

(1) All ENE shall be capable of operating continuously to the specifications throughout its normal life span in the HKSAR climate and environment. The following parameters shall apply unless otherwise stated:

1. Ambient temperature between 0º C and 40º C; and between -5º C and +50º C if the equipment (including display units and antennae) is exposed to the open air;
2. Relative humidity up to 95%, non-condensing;
3. Salt and chemical corrosion as found in a tropical coastal environment; and
4. Materials that promote mould growth shall not be used.

(2) ENE shall be capable of withstanding the knocks and jolts likely to occur during repair work or rough handling.

(b) Power Supplies:

(1) The power supply for all ENE shall be protected by appropriate circuit-breakers;

(2) All the ENE shall be capable of working normally when powered by the Vessel's battery-backed D.C. supply system. A converter shall be provided if required;

(3) Two spare power supply connections shall be required with a negative earth and be connected to a designated 12 Volt D.C. (nominal) battery-backed power supply. The battery shall be charged up when an engine generator is working;

(4) There is a possibility of D.C. leakage through the negative grounding to the D.C. battery power bank on the supplied Equipment if it is not connected properly. The Contractor shall take precautions to prevent this type of leakage, e.g. by using an isolation converter;

(5) The ENE's power supply shall be compatible with the Vessel's electrical system. If necessary, a voltage stabiliser or regulator shall be provided and installed to maintain the ENE in proper working condition when connected to the unsteady D.C. voltage from the generator to protect the ENE from the adverse effects of excessive voltage, current spikes and surges; and

(6) Selected ENE equipment shall be connected to individual external switches for controlling the power on or off status of the individual ENE equipment and the illumined device on the control panel. The location of external switches shall be easily accessible. The actual devices to be connected to the external switches shall be subjected to approval by HKPF.

(c) Safety:

(1) All ENE supplied shall be of a safe design and shall be installed in a safe manner as approved by the GNC and COMMS. The standard of installation shall enhance the Equipment's safety features and not present any hazards to the user;

(2) All ENE shall be properly grounded to an electrical earth. The installation shall not present hazards to the user in any way, e.g. grounding of all metal parts exposed to the user;

(3) Electrical contacts and print circuit boards ("PCB") shall also be protected in an appropriate manner that does not impair their electrical characteristics;

(4) Lightning protection device(s) (e.g. lightning surge arrestor(s) / dissipater(s)), complying with the requirements specified in Paragraph 8.10, are required, particularly for antennae installed outside the protection zone of the Vessel's own lightning protection device(s);

(5) The lightning surge arrestor(s) / dissipater(s) of each feeder cable, complying with the requirements specified in Paragraph 8.10, shall be grouped and concentrated in a "lightning arrestor / dissipater panel" to be located inside the console for ease of maintenance; and

(6) Warnings of any potential hazards associated with the ENE shall be displayed in Traditional Chinese characters, English and universally recognised labels, in visibly prominent positions.

(d) Design Practice:

(1) All systems shall be designed for prolonged, continuous and reliable operation, i.e. twenty-four (24) hours per day and 365 days per year;

(2) The normal serviceable life of the ENE shall be a minimum of five (5) years operation onboard the Vessel. During the serviceable lifetime of the ENE, it shall be possible to maintain the ENE performance with reasonable repair and set up as defined in this Part VII;

(3) The design and construction shall be performed to a standard of engineering acceptable to COMMS and the ENE shall withstand handling and transportation without degradation of performance;

(4) The display digits in the ENE control panel shall be easily legible;

(5) To facilitate night time operations, ENE control panels shall have a dimming function enabling the light emitted from the ENE display to be regulated progressively, if applicable;

(6) All units, sub-assemblies, components and adjustable controls of the same type shall be both mechanically and electrically interchangeable without the need for changing connections or wiring. They shall be readily accessible for maintenance purposes;

(7) Correct impedance matching shall be maintained at all interfaces between any items of any equipment (e.g. audio at 600 ohms or RF at 50 ohms);

(8) Adequate testing points and other testing facilities, e.g. extension boards, testing probes, shall be provided to permit ease of maintenance; and

(9) Any equipment installed in an external position and exposed to the maritime environment shall have the level of IP protection appropriate to its function and position.

9.2.6 Appearance and Protective Finish:

(a) Metal surfaces shall be either corrosion resistant or protected against corrosion for a period of at least three (3) years by high grade enamel painting, plating, galvanising, anodising, or any other suitable surface treatment; and

(b) Any such protective layer shall be smooth, continuous, and free from blemishes and scratches.

9.2.7 Installation Standards:

(a) All ENE, except portable ENE, shall be fixed firmly in place. Fastenings and supports shall support their loads with a safety factor of at least three (3);

(b) The ENE shall be supplied with all auxiliary items required including but not limited to the following for normal operation:

(1) Connectors;

(2) Circuit-breakers;

(3) Lightning arrestors / dissipaters;

(4) Power sockets;

(5) Plugs; and

(6) Cables.

(c) RF connectors (of suitable impedance) shall be provided and used for connections for the RF cables, antennae and radio equipment;

(d) All exposed connectors shall be protected by weatherproof material (e.g. 3M self-adhesive tape or equivalent) to prevent water ingress;

(e) Special attention shall be paid to the compass safe distance [Marine Guidance Note MGN 57 (M+F) and IMO Resolution A.694 (17)] of the ENE and the Radiation Hazard Zone of the radar scanner in the Vessel's design. Positioning of the ENE and the associated accessories shall be planned carefully in respect to their relative distances to eliminate any chance of radio interference that might occur during operational use;

(f) Installation shall be to the highest standard to ensure:

(1) The relevant Merchant Shipping Notices ("M Notices") published by the Department of Transport (London), in the version as at the Contract Date unless it specifies that version of such standard as at the commencement of construction of the Vessel shall apply in relation to the relevant requirements specified therein, in respect of setting and installing the compass, VHF radio and sounding devices are observed;

(2) Satisfactory performance of the ENE;

(3) Protection from mechanical and water damage;

(4) Ease of accessibility for maintenance and repair;

(5) Manufacturers' recommendations are followed strictly;

(6) Precautions and measures shall be taken and adopted in the installation of the ENE to ensure that the g-forces and vibration encountered by the Vessel travelling at high speed in rough seas will not affect the operation of the ENE; and

(7) The installation in the external environment shall withstand the conditions stated in Paragraph 9.2.5(a)(1) of this Part VII.

Adequate measures to prevent interference between the ENE shall also be provided, which for receiving apparatus and other ENE that may be affected by frequency induced voltage shall include being earthed, screened and protected efficiently according to the rules, regulations and recommended practices regarding screening of electric wiring;

(g) All precautions and provisions shall be taken and made to minimise the effect of sea spray and exposure to weather on the console panels, equipment controls and display units and, to protect the Equipment in such conditions. Suitable weather protection covers, which do not obstruct users from operating the equipment, shall be provided as necessary; and

(h) All the equipment cables shall be covered properly so that they will not be destroyed or loosened by people and water.

9.2.8 Cable Laying

(a) General Cable Requirements:

(1) All cables shall be rated and sized properly;

(2) The signal cables shall be screened properly to reduce the cross-talk level as necessary; and

(3) All feeder cables shall be of one length, without joints, from antennae to the Equipment and from equipment to equipment, unless such joints are necessary under the specific installation conditions encountered or for ease of maintenance. All joints if provided shall be reliable and durable.

(b) Cables shall be laid in concealed cable trunks and trays inside consoles or other compartments or under the deck unless approved otherwise by the GNC and COMMS, with due consideration given to the ease of maintenance of the Vessel as a whole. Solutions adopted shall not pose occupational safety and health risks such as tripping, snagging or impact hazards to the Vessel's crew during operations.

(c) Watertight rubber grommets, insulated bushes or cable glands shall be used to protect the cables when passing through the metal covers of distribution boards, boxes, or any other metal work or exposed structure.

(d) The Contractor shall be responsible for the supply, installation and inter-connection of all cables and all related installation materials within the system, as well as the final connection between the power supply and the ENE.

(e) Wires and cables shall be as short as practicable with sufficient slack:

(1) To enable parts to be removed and replaced during servicing without disconnecting other parts;

(2) To facilitate field repair of broken or cut wires; and

(3) To facilitate movement of the Equipment for maintenance purposes.

(f) All wiring terminations shall be finished in a neat and approved manner and shall be identified separately by a unique identification wiring code number.

9.2.9 Labelling and Marking

(a) All ENE supplied shall carry the name, trademark or other means of identifying the manufacturer;

(b) Major ENE units and sub-units shall carry a permanent label with serial numbers for identification purposes;

(c) All panels, ENE sub-assemblies and internal and external cables shall be marked or labelled clearly with their own unique identification codes in English, in a permanent manner, so as to identify each individual function. Such labels shall be recorded and organised properly in a document and handed over to COMMS through GNC prior to Delivery Acceptance;

(d) All switches, connectors, jacks or receptacles shall be marked clearly, logically and permanently during installation. All wires and cables shall be identified at every termination and connection point with permanent type markers; and

(e) The DC circuit-breakers controlling the Equipment shall be labelled clearly.

9.2.10 Acceptance Test

(a) The acceptance tests for the ENE shall consist of on-site commissioning tests as follows:

(1) The on-site commissioning tests shall be carried out by the Contractor as part of the Technical Acceptance in the presence of GNC and COMMS officers after completion of installation of all ENE; and

(2) The on-site commissioning tests shall include an inventory check, an NIR hazard test, ENE installation inspection and thorough technical, functional and integration tests of individual ENE items and all ENE together as a whole and, a sea trial, to verify that

the ENE has been commissioned properly and is ready to be put into service on the Vessel.

(b) The Contractor shall ensure and demonstrate, as part of the on-site commissioning tests, that the electrical and magnetic fields as well as the power density radiated from all installed ENE do not expose occupational personnel and members of the general public to radiation in excess of the limits contained in the 1988 IRPA Guidelines specified in Paragraph 9.2.2 of this Part VII. Prior to the issuance of the Acceptance Certificate, the Contractor shall provide a full written report stating that the installation of the ENE complies with the stated NIR safety standards; and

(c) At least two (2) months prior to the on-site commissioning tests, the Contractor shall submit details of the schedules and test procedures of all ENE for COMMS approval. Once all of the test procedures have been established and agreed by the HKPF, these shall be followed during the relevant tests. Any delay in the submission of these procedures may lead to a corresponding delay in their agreement and, hence, in the commissioning of the Equipment for which the Contractor will assume the financial liability.

9.2.11 Documentation

(a) At least six (6) weeks prior to Delivery Acceptance, for each individual item of Equipment, the Contractor shall supply to COMMS, through GNC, three (3) paper copies of the operational manuals and maintenance manuals in English (at least one (1) original) and two (2) soft copies in DVD format. For the avoidance of doubt, these three (3) sets of operation and maintenance manuals are in addition to those required as part of the documentation for each Vessel set out in Paragraph 10.2.3(h) of this Part VII. The manuals shall provide the information listed below:

(1) Description of the principle of operation;

(2) Details of installation and setting up procedures;

(3) Maintenance instructions including mechanical assembling and disassembling procedures;

(4) Schematic diagrams and block diagrams with their respective descriptions; and

(5) Fault finding and calibration procedures.

(b) Drawings showing the proposed design of conduit / trunking routes for the Equipment installed onboard, including future maintenance considerations shall be submitted to GNC and COMMS for approval before installation.

(c) At Delivery Acceptance, the Contractor shall supply:

(1) Operational manuals and maintenance manuals specified in Paragraph 9.2.11(a) of this Part VII;

(2) Properly organised individual Equipment testing results including details of test and calibration procedures;

(3) On-site commissioning and sea trial reports of all Equipment as witnessed by COMMS;

(4) The initial parameter settings and readings of all Equipment at the time of the on-site commissioning;

(5) "As installed" drawings showing the positions of all individual items of the Equipment installed and the routing of the interconnecting cables between equipment;

(6) A block diagram showing the interconnections between all equipment units complete with their technical protocols and the wiring schedule;

(7) "As fitted" diagram showing the locations and positions of all circuit-breakers controlling the power to the Equipment; and

(8) The completed NIR Report as required by Paragraph 9.2.10(b) of this Part VII.

(d) The documents specified at Paragraphs 9.2.11(a) to (c) of this Part VII and the training materials specified in Paragraph 9.1.4 of this Part VII shall be supplied in both paper copy and in DVD format or other format acceptable to COMMS; and

(e) The Contractor shall not use confidentiality as a reason for withholding the supply of relevant documentation as required by the GNC and HKPF.

9.2.12 Electronic Components / Spares Parts / Spare Units / Maintenance

The Contractor shall commit to provide spare parts for the Equipment for a period not less than five (5) years from the date of the successful commissioning of the last Vessel.

9.2.13 Warranty Services

(a) The Contractor shall provide a one (1) year free Warranty Period without any qualification for all ENE with effect from the date that the Acceptance Certificate in respect of that Vessel was issued;

(b) The Contractor shall rectify any fault in accordance with the requirements as specified in Paragraph 1.7 of Annex 1 to the Part VII. The Contractor shall extend the Warranty Period for any item of equipment constituting the ENE which has broken down and required repair for a period equal to the period between the date of breakdown and the resumption of operation and service;

(c) The Contractor shall keep sufficient spare parts for the ENE in Hong Kong with no extra cost to Government for fulfilling the warranty services requirement as specified in Paragraph 9.2.13(b) of this Part VII; and

(d) The Contractor shall indemnify the Government in respect of any damages to all the HKPF equipment if the damages were caused by defects or malfunctions of the Vessel or its equipment onboard. Paragraph 1.4 of Annex 1 of this Part VII shall also apply to all HKPF equipment as specified in this Part VII.

9.3 Electronic Navigational Equipment Specifications

9.3.1 Magnetic Compass

(a) The Contractor shall supply and install one (1) magnetic compass (with a spare bowl) situated at the console at the main steering position. The compass shall be mounted in a gimbal device, fitted with an independent dimmer switch, installed on the top of the console in line with the coxswain's line of sight dead ahead.

(b) The compass shall have illumination from the primary and emergency power supply and shall be dimmable. The compass shall be provided with the required correcting device suitable for the Vessel.

(c) The magnetic compass is to be supplied in accordance with requirements of any one of the RO or RA requirements, with product certificate / type approval provided.

(d) The magnetic compass shall be capable of operating without power supply.

(e) The magnetic compass shall be adjustable and properly calibrated in the HKSAR. The Contractor shall supply a deviation card for the magnetic compass.

9.3.2 Satellite Compass

(a) The Contractor shall supply and install one (1) satellite compass set. The installation location of satellite compass shall submit to HKPF for approval during mock up meeting before installation.

(b) The sensor unit shall incorporate two (2) or more satellite receivers from at least two (2) types of satellite positioning system.

(c) The satellite compass shall incorporate integrated 3-axis rate gyro and acceleration sensors to deliver fast start-up times and provide heading updates even during temporary loss of satellite signals (i.e. during navigation under bridges).

(d) The satellite compass shall support GPS, GLONASS, BeiDou, Galilo and QZSS for pinpoint global positing and heading accuracy.

(e) Performance:

(1)	Reference:	Either Magnetic North or True North
(2)	Warm-up Time:	Less than one second
(3)	Time To First Fix:	Cold Start <60s
		Warm Start <30s
		Reacquisition <2s
(4)	Heading Accuracy:	+1.0° typical
(5)	Resolution:	0.1°
(6)	Deviation Compensation:	Automatic
(7)	Operating Temperatures:	Sensor unit: 0°C to 50°C; Display unit: 0°C to 55°C
(8)	Waterproofing:	Sensor unit: IPX5, Display unit: IPX6

9.3.3 Public Address ("PA") / Siren, Loudhailer / External Broadcasting System:

(a) The PA / siren, loudhailer / external broadcasting system shall be an off-the-shelf product and no customization shall be required;

(b) The system shall function as a siren and powerful loud hailing system designed especially for hailing and alerting other craft in the marine environment. It shall consist of a master control unit, a control panel, a fist microphone, amplifier, horn type loudspeaker(s) and related components and accessories;

(c) In manual mode, the system shall be capable of generating both a "yelp" siren and a horn sound signal. In automatic mode, the system shall have a selection of at least six (6) warning signal sounds for general marine navigational use;

(d) The master control unit shall be recessed into the console with the user control panel flush-mounted on the console and positioned within reach of the coxswain. The user control panel shall incorporate "Power ON / OFF", "Hail Volume Control" and "Function Control";

(e) Verbal messages shall be broadcast through a fist microphone mounted on the console;

(f) The loudspeakers shall have a power rating of twenty (20) watts minimum and an impedance which shall match the amplifier;

(g) The system shall be waterproofed to IPX5 standard or better;

(h) The loudspeakers shall be equipped with a volume control system with which the volume can be adjusted to a minimum for night time operations and to a maximum level which will enable messages to be heard at least 0.2 km away;

(i) The positions of all the system's main components shall be discussed at the kick-off meeting; and

(j) The vessel horn operation shall be direct acting, simple and easy for vessel user operate especially in emergency situation. The vessel horn shall not be a horn speaker driven by ENE equipment multi-purpose PA amplifier. The vessel horn shall be a 12V electric horn, powered by vessel battery and operated by pressing electric horn switch.

9.4 Marine Band Hand-held Waterproof VHF Radio Transceiver

9.4.1 **General Requirement**s

(a) The Contractor shall supply three (3) GMDSS IMM VHF waterproof handheld transceivers per Vessel.

(b) Each portable IMM VHF transceiver shall be of proprietary make and complete with two (2) sets of rechargeable batteries, battery charger, helical antenna with V.S.W.R. not exceeding 1.5:1 and carrying case (with shoulder strap or belt clip).

(c) The operation period of each fully charged battery shall not be less than eight (8) hours per charge (10% transmit, 10% receive, 80% stand-by). The charger shall be designed for 220V AC input power supply and equipped with a BS 1363 type 13A power plug.

(d) The portable transceiver shall, as a minimum, be capable of transmitting and receiving on all 55 International Maritime VHF channels, together with the private maritime VHF single frequency channels 96 (157.925MHz) and/or 99 (157.975MHz).

(e) The transceiver shall be of robust, waterproof, light weight design and made with shock proof material suitable for handheld radio communications both on the Vessel and ashore.

(f) The transceiver shall be fully solid state and of software programmable carrier frequency type. Add-on crystal for carrier frequency will not be acceptable.

(g) The unit shall be a type approved model accepted by OFCA for maritime frequency band application.

9.4.2 Performance Requirements

(a) The transceiver shall, as a minimum, incorporate the following controls/switches/functions:
(i) Power on/off button;
(ii) Volume control;
(iii) High/low transmitting power switch;
(iv) Press to talk switch;
(v) Built-in microphone and loudspeaker;
(vi) Channel selector operating channel display; and
(vii) Sockets for external microphone, press to talk and loudspeaker.

(b) The transceiver shall comply with the following:
(i) Operating frequency range : International Maritime VHF Band;
(ii) No. of Operating Channels: 99 (programmable);
(iii) Channel spacing: 25kHz; and
(iv) Housing IP Category: IP 57.

9.5 Secure Automatic Identification System ("S-AIS")

9.5.1 The Contractor shall supply one (1) set of S-AIS transponder to be installed on the Vessel. The model to be offered shall be specified by the Tenderer in Schedule 6.

9.5.2 The S-AIS shall comply with SOLAS Class A and it shall include transponder, onboard AIS display, VHF antenna, GPS GNSS antenna, secure mode switch for Police Vessels which shall operate with AIS Base Stations in the hilltops as normal AIS and secure AIS via the global maritime AIS channels and/or a third VHF frequency carrier in the range of 156-163 MHz to automatically transmit and receive AIS messages including but not limited to ship name, Maritime Mobile Service Identity ("MMSI"), call sign, dimensions, position and other sensor information as selected by secure mode switch.

9.5.3 The S-AIS shall be fully Class A type approved secure AIS transponder. The version of the secure AIS shall allow to export to Hong Kong. The Equipment shall be compatible to the Sinology AIS shipborne equipment XWA-200S and base station equipment XWM-100 for exchange the AIS information with control centres and police launches and vessels.

9.5.4 The S-AIS shall support cipher Data Encryption Standard ("DES"), Advanced Encryption

Standard ("AES") and support cipher keys:

(a) Up to 256-bits or above time limited keys;

(b) Manual keys input;

(c) Imported from portable USB memory; and

(d) External application input.

9.5.5 The S-AIS shall be equipped with internal GPS receiver, GLONASS receiver and Beidou receiver for time synchronisation and be connected to the GPS systemand Satellite Compass.

9.5.6 Each S-AIS shall be supplied with one (1) VHF Antenna:

(a) Frequency: 149-162.5MHz;

(b) VSWR: 1.5:1;

(c) Polarization: Vertical;

(d) Max Power: 100W;

(e) Impedance: 50 ohms; and

(f) Surge arrestor connecting to the lightning ground of the Vessel.

9.5.7 Each unit of S-AIS shall be provided with one (1) combined VHF / GPS antenna dedicated for the secure AIS equipment. The Contractor shall provide and install suitable co-axial cable surge suppressors for the VHF and GPS antennae to protect the secure AIS equipment from lightning surges.

9.5.8 The VHF antenna, GPS antenna and combined VHF / GPS antenna shall fulfil the following requirements:

(a) VHF band Frequency:156.025 - 162.025 MHz;

(b) GPS and Beidou Frequency: 1575.42 MHz / 1561.098 MHz;

(c) VSWR: <2:1; and

(d) Nominal impedance: 50 ohms.

9.5.9 The S-AIS shall be able to select, operate and display in at least three (3) modes of operations including but not limited to:

(a) Normal mode - function as a normal SOLAS Class A AIS broadcasting and receiving without encryption;

(b) Secure mode - only encrypted AIS data will be broadcast, both encrypted and non-encrypted AIS messages will be received; and

(c) Silent mode - no AIS will be broadcast, both encrypted and non-encrypted AIS messages will be received.

9.5.10 The S-AIS shall equip a display unit for showing the S-AIS information and S-AIS equipment configuration.

9.5.11 The Contractor shall provide and install a secure mode switch on the dashboard to enable the officer to change the operational modes as specified in Paragraph 9.5.9 of this Part VII.

Chapter 10 Services and Support

10.1 General Requirements

10.1.1 In determining the appropriate design for the Vessel, all of the following factors shall be taken equally into account:

(a) Vessel performance;

(b) Operational requirements;

(c) Initial cost;

(d) Through life operational costs (e.g. maintenance cost, fuel consumption, spare parts);

(e) Reliability (frequency and time to repair);

(f) Time interval between maintenance periods;

(g) Time to undertake scheduled maintenance (downtime); and

(h) All machinery and equipment installed in the Vessel shall be serviceable in the HKSAR.

10.1.2 Maintainability - the Vessel shall be easy to maintain by ensuring that there shall be:

(a) Good access to all installed items for monitoring, service and overhaul; and

(b) Readily available in-situ service and maintenance in the HKSAR.

10.1.3 Allowable Vessel downtime (including scheduled preventive maintenance and unscheduled repair and maintenance) shall not exceed 10% of the total hours of operation per month based on the operational profile as specified in Paragraph 2.7.2 of this Part VII.

10.2 Information to be provided prior to and at Delivery Acceptance

10.2.1 Not later than six (6) weeks prior to Delivery Acceptance, the Contractor shall supply the Inventory List to the GNC and HKPF for approval. The detailed Inventory List shall be for the whole Vessel, covering all discrete items down to major component/unit level. Full details of each item shall include:

(a) Item number;

(b) Description;

(c) Type or model (if applicable);

(d) Serial number(s);

(e) Quantity;

(f) Manufacturer;

(g) Manufacturer’s reference number;

(h) Location of the item in the Vessel;

(i) Local agent / supplier address, telephone and facsimile numbers and email address;

(j) Order lead time;

(k) Shelf life; and

(l) Unit cost.

10.2.2 In addition, the documents for the ENE shall be provided as described in Paragraph 9.2.11 in this Part VII.

10.2.3 At Delivery Acceptance, the Contractor shall provide the GNC with the following:

(a) Four (4) paper copies and two (2) soft copies on DVDs of the approved inventory list;

(b) Four (4) complete sets of paper print “as fitted” drawings of the Vessel and two (2) soft copies on DVDs;

(c) Four (4) complete sets of paper print “as fitted” electrical schematic, cabling, wiring and single line diagrams for electrical equipment installed on board and conduit / trunk route diagrams and two (2) soft copies in DVDs as per the Vessel delivered;

(d) Four (4) paper copies and two (2) soft copies in DVDs of a list of all bought-in machinery and electrical equipment installed on the Vessel, where the list shall include:

(1) Description;

(2) Type or model (if applicable);

(3) Makers part number or equivalent (if applicable);

(4) Location;

(5) Quantity;

(6) Supplier or agents name and contact details;

(7) Order lead time;

(8) Shelf life; and

(9) Unit cost;

(e) Four (4) copies (at least one (1) original) of manufacturers' operation, maintenance and workshop manuals in English and Traditional Chinese for all machinery and Equipment, including spares and stores, special tools and test equipment;

(f) Four (4) paper copies and two (2) soft copies in DVDs of the Contractor's "Docking Plan", which shall include the profile, plan and sections as per the Vessel delivered;

(g) Four (4) paper copies and two (2) soft copies in DVDs of the On Board Operator's Manual (English and Traditional Chinese) for the Vessel delivered covering:

(1) Daily user check and operational procedure;

(2) Operating details of each system; and

(3) Emergency operation procedure.

(The precise format and details required shall be subject to the Government's approval when the configuration of the Vessel and outfitting is decided); and

(h) One (1) set in paper format of the operational manuals and maintenance manuals in English as specified in Paragraph 9.2.11 of this Part VII for each individual item of ENE. For the avoidance of doubt, this set of operation and maintenance manuals is in addition to the sets which are required to be supplied in accordance with Paragraph 9.2.11 of this Part VII.

10.2.4 The first draft of the On Board Operator's Manual (in both English and Traditional Chinese) mentioned in Paragraph 10.2.3(g) of this Part VII shall be submitted to GNC for approval not less than one (1) month before Delivery Acceptance.

10.2.5 Tools and Test Equipment for Electronics

All tools and testing equipment for the Vessel's electronic equipment shall be delivered directly to COMMS. All items shall be documented, preserved and packed properly.

10.2.6 Photographs

The Contractor shall at Delivery Acceptance provide the following:

(a) As-Fitted Photographs

(1) Two (2) sets of colour prints (130 mm x 90 mm) from different aspects to give an overall picture of the various parts/areas of the Vessel; and

(2) Each set of prints shall be presented in a suitable album, indexed and labelled appropriately to ensure that the position from which the picture was taken and the position of the subject in the picture are clearly identifiable.

(b) Official Photographs

(1) Four (4) framed colour photographs of picture size not less than 350 mm x 270 mm and a frame size not less than 510 mm x 400 mm showing the profile of the Vessel in Hong Kong Waters;

(2) Four (4) 200 mm x 150 mm colour photographs showing the profile of the Vessel in Hong Kong Waters; and

(3) Four (4) 150 mm x 100 mm colour photographs showing the profile of the Vessel in Hong Kong Waters.

(c) Softcopy of Photographs

(1) All of the photographs specified at sub-paragraphs (a) and (b) of this Part VII shall be taken using a digital camera with a resolution of at least 12 megapixels and be forwarded to GNC on a DVD in RAW and JPEG formats at Delivery Acceptance.

10.2.7 Certificates and Reports

Copies of the following documents (one (1) original with two (2) copies and one (1) softcopy stored in DVDs), filed in clear folders, shall be forwarded to GNC at Delivery Acceptance:

(a) Associated test certificates;

(b) Equipment test performance certificates (e.g. electronics, switchboards, etc.);

(c) Main engine performance test certificates;

(d) Complete record of the Official Sea Trial commissioning tests;

(e) Original warranty certificates of all machinery, Equipment and apparatus of the Vessel (valid for twelve (12) months from the date of Acceptance Certificate of the Vessel);

(f) Certificates of light and sound signalling equipment;

(g) Builder certificates;

(h) Certificates of building material;

(i) Deviation card for compass (after adjustment in the HKSAR);

(j) COC as described in Paragraph 2.2.2 of this Part VII, or equivalent;

(k) Undertaking duly signed and sealed by the Contractor's (or its sub-contractor's) shipyard to provide Warranty Services in relation to all aspects of the Vessel during the Warranty Period in the HKSAR as stipulated in Annex 1 of this Part VII;

(l) Asbestos free certificate or statement of compliance; and

(m) Any other certificates as appropriate.

10.2.8 Vessel's Model

The Contractor shall provide the Government with three (3) Vessel models suitably scaled so that the model length overall is between 300 mm to 400 mm. The models shall include all major external fittings above and below the waterline such as the collar, console, hull, appendages including skirt, propulsion system, mast, mast fittings and navigation lights, lifesaving equipment, fire-fighting equipment and cleats, etc. according to the approved GA Plan as agreed by the Government. The Vessel model and fittings shall be made to an overall exact scale standard relevant to model making.

Chapter 11 Training

11.1 General

11.1.1 This chapter stipulates the training requirements on Electronic Navigational Equipment and for the operation and maintenance of the Vessel, and shall be arranged by the Contractor.

11.1.2 All training courses shall be held in the venue to be provided by the HKPF in the HKSAR. The training shall be conducted in Cantonese and / or English with relevant training materials in both Traditional Chinese and English supplied by the Contractor.

11.1.3 If any of the training instructor(s), trainer(s) and any other personnel providing the training, are

travelling from outside Hong Kong, all the training shall be provided by such personnel in one visit

11.1.4 Unless otherwise specified, the Contractor shall provide all material necessary for conducting the training courses specified in Paragraphs 11.2 and 11.3 of this Part VII.

11.2 Training on Electronic Navigational Equipment (ENE) Maintenance

11.2.1 ENE Maintenance Training Course

(a) The ENE maintenance training course shall enable the maintenance staff to:

(1) Acquire full knowledge on day-to-day operation, inter-connected system operation, fault breakdown, routine maintenance and fault finding / repairing procedures of the ENE being offered; and

(2) Effectively maintain the ENE. This shall include practical demonstrations and tests.

(b) The maintenance training shall include the following items:

(1) Introduction of the Equipment locations;

(2) Equipment operation, working principles and functional description;

(3) Equipment block and schematic functional drawings and descriptions;

(4) Equipment adjustment / calibration procedures and parameter settings;

(5) Equipment construction and mounting;

(6) Equipment and signal interfacing; and

(7) Preventive maintenance and trouble-shooting.

(c) The course shall enable technical staff to effectively maintain the Equipment; and

(d) The course shall be held immediately after the commissioning of the Equipment on the Vessel; and

(e) The training course shall accommodate up to twenty (20) trainees.

11.3 Training on Operation and Maintenance of the Vessel

11.3.1 The Contractor shall provide the HKPF's operational officers and both the HKPF's and Government Dockyard Maintenance and Support Section's technical and maintenance staff, with both classroom-based and hovercraft-based training, to familiarise them with the operation and maintenance of the Vessel.

11.3.2 In respect of the operation and maintenance of the Vessel, the Contractor shall provide the following training:

(a) Operator training on Vessel operations to the HKPF's operational staff; and

(b) Engine and on board Equipment maintenance training to the technical and maintenance staff of both the HKPF and the Government Dockyard Maintenance and Support Section.

11.3.3 Operator training on Vessel operations

(a) In respect of the Vessel operator's training course, the Contractor shall, not less than two (2) months prior to Delivery Acceptance, submit for the HKPF and GNC's approval, a draft hovercraft operator's training manual, which shall cover on board ENE Equipment, systems, first level maintenance and troubleshooting, as well as all aspects of hovercraft handling. The draft shall include details of the depth, duration and scheduling of the proposed training course and the qualifications possessed by the proposed training instructor(s).

(b) Upon Delivery Acceptance, the Contractor shall then deliver the hovercraft operator's training course according to the approved manual to HKPF operational staff.

11.3.4 Engine and On Board Equipment Maintenance Training

(a) In respect of the engine and on board Equipment maintenance training course, the Contractor shall, not less than two (2) months prior to Delivery Acceptance, submit for the HKPF and GNC's approval a draft engine and on board Equipment maintenance train-the-trainer training manual, which shall include, but not be limited to, all aspects of the design, day-to-day operation, breakdown, routine maintenance and fault diagnosis of the engine / electrical distribution system and hull structural repair. The draft shall include details of the depth, duration and scheduling of the proposed training course and the qualifications possessed by the proposed training instructor(s).

(b) The Contractor shall then deliver the engine and on board Equipment maintenance training course according to the approved manual to twenty-two (22) officers of Government Dockyard Maintenance Section technical and maintenance staff in the HKSAR.

11.3.5 All facilities, venues, and materials necessary for the training courses mentioned in Chapter 9 of this Part VII and otherwise required in these Technical Specifications shall be provided by the Contractor unless otherwise specified. The training shall also be conducted in Chinese (Cantonese) and / or English with relevant training materials to be supplied by the Contractor. The training materials shall be provided before the training, in both paper and digital format.

11.3.6 The Contractor shall, upon successful completion of either of the courses specified at Paragraphs 11.3.3 and 11.3.4 above, issue each training course participant with a certificate as evidence of his / her attendance on the training course and the standards of competence achieved.

Chapter 12 Abbreviations

ABS	American Bureau of Shipping
AC	Alternating Current
AFFF	Aqueous Film-Forming Foam
AIS	Automatic Identification System
AML	Additional Military Layers
ARCS	Admiralty Raster Chart Service
ARPA	Automatic Radar Plotting Aid
ASTM	American Society for Testing and Materials
ASWF	American Standard Window Film
AV	Audio Video
AVLS	Automated Vehicle Location System
AWS	American Welding Society
BNC	Bayonet Neill-Concelman
BS	British Standards
BSB	data encoded in the BSB format
BWA	Biological Warfare Agent
CBRN	Chemical, biological, radiological and nuclear
CCD	Charge-coupled device
CCTV	Close Circuit Television
CD	compact disc
cd/ m2	candela per square metre
CD-ROM	Compact Disc Read-Only Memory
CFC	Chlorofluorocarbon
CH	Channel
cm	centi metre
FM200	heptafluoropropane
COG	course over ground
CPA	Closest Point of Approach
CPU	Central Processing Unit
CRT	Cathode ray tube
c/w	Come with
CWA	Chemical Warfare Agent
dB	Decibel
dBi	decibel isotropic
dBm	Decibel-milliwatts

DC	Direct Current
DDR	Double Data Rate
deg	Degree
DGPS	Differential Global Positioning System
DISS	DNC Digital Nautical Chart
DPDT	Double-pole, double-throw
DSC	Digital Selective Calling
DTRS	Digital Trunk Radio System
DVD	Digital Versatile Disc
DVI	Digital Video Interface
DVR	digital video recorder
E.C.C.	Engine Control Console
ECDIS	Electronic Chart Display and Information System
ECS	Electronic Chart System
EFFS	External Fire-Fighting System
EFCP	External Fire-Fighting Control Panel
EGNOS	European Geostationary Navigation Overlay Service
ENC	Electronic Navigational Charts
ENE	Electronic Navigational Equipment
E/R C.C.	Engine Room Control Console
Fan / fan	Propeller or fan
FTP	Fire Test Procedures
FO	Fuel oil
FOV	Field of View
g	Gravity
GB	Gigabyte
GeoTIFF	Format File
GHz	Gigahertz
GM	Metacentric Height
GMDSS	Global Maritime Distress Safety System
GMT	Greenwich Mean Time
GPS	Global Positioning System
GRP	Glass-reinforced plastic
GZ	Righting Lever
HazMat	Hazardous Material
HEPA	High-efficiency particulate arrestance
HCFC	Chlorodifluoromethane
HD	Hard Disk

HDD	Hard Disk Drive
HDMI	High Definition Multimedia Interface
HPS	Harbour Patrol Section
HSC	High-speed Craft
HVAC	Heating, ventilation and air conditioning
Hz	Hertz
ICR	Information Collection Request
IHO	International Hydrographic Organization
IMM	International Maritime Mobile
IMO	International Maritime Organisation
IEC	International Electrotechnical Commission
IP	Ingress Protection
IPX	Internetwork Packet Exchange
IR	Infrared
IS	Intact Stability
ISO	International Organization for Standardization
ITU-R	International Telecommunication Union – Radiocommunication Sector
K	Kilo
kΩ	Kilo Ohm
kg	Kilogram
kHz	Kilohertz
km	Kilometre
km/h	Kilometre per hour
kts	Knots
kW	Kilowatt
L/min	litre per minute
LO	Lube oil
LCD	Liquid Crystal Display
LCG	Longitudinal Centre of Gravity
LED	Light-emitting Diode
L/s	Litre per second
LSA	Lifesaving Appliances
m	Metre
m/s	Metre per Second
m3	Cubic Metre
M/E	Main engines
MARPA	Mini-automatic Radar Plotting Aid
MCR	Maximum Continuous Rating

MCS	Monitoring and Control System
MEI	MEI Corporation
MFD	Multi-function Display
MHz	Megahertz
MJ/ m2	Megajoule per Square Metre
MKD	Minimum Keyboard Display
mm	Millimetre
MMC	Multi Media Card
MMSI	maritime mobile service identity
mph	Mile per hour
MS PRO	Memory Stick PRO
MS PRO Duo	Memory Stick PRO Duo
MSC	Maritime Safety Committee
mV	Milli Voltage
NAVSEA	Naval Sea Systems Command
NIR	Non-Ionizing Radiation
Nm	Nanometre
NFPA	National Fire Protection Association
NMEA	National Marine Electronics Association
ns	Nanosecond
NTRIP	Networked Transport of RTCM via Internet Protocol
NUC	Not Under Command
OBE	On-board electronics
OSHA	Occupational Safety and Health Administration
Pa	Pascal
PAL	Phase Alternating Line
p.s.i.	Pounds per square inch
PTO	Power take off
PVC	Polyvinyl Chloride
RAM	Random Access Memory
RCA	Radio Corporation of America
RGB	Red Green Blue
RF	Radio Frequency
RG58U	RG58U Type Coaxial Cable
RH	Relative Humidity
ROT	rate of turn
rpm	revolutions per minute
RT	Radioactive Test

RTCM	Radio Technical Commission for Maritime Services
SATA	Serial Advanced Technology Attachment
SBAS	Satellite-based augmentation systems
SENC	System Electronic Navigation Chart
SINAD	Signal-to-noise and Distortion Ratio SOG speed over ground
SOLAS	Safety of Life at Sea
SPL	Sound Pressure Level
SSD	Solid-state Drive
STANAG	NATO Standardization Agreement
TCG	Transverse Centre of Gravity
TCPA	Time of Closest Point of Approach
TFT	Thin-Film Transistor
TIFF	Tagged Image File Format
TMR	TOPEX/Poseidon Microwave Radiometer
TS	Technical Specifications
UHF	Ultra High Frequency
UPS	Uninterruptible Power System
USB	Universal Serial Bus
UTC	coordinated universal time
uV	nano voltage
UV	Ultraviolet
VAC	Voltage of Alternating Current
VCG	Vertical Centre of Gravity
VDC	Voltage of Direct Current
VDR	Voyage Data Recorder
VGA	Video Graphics Array
VHF	Very High Frequency
VMAP	Vector Map
V.S.W.R.	Voltage Standing Wave Ratio
VTC	Vessel Traffic Centre
VTS	Vessel Traffic Services
W	Watt
WMS	Web Map Service
W/H E.C.C.	Wheelhouse Engine Control Console

Part VII - Annex 1 - Warranty Services and Guarantee Slipping

1. Warranty Services

1.1. The Contractor shall provide Warranty Services in relation to all aspects of the Vessel during the Warranty Period, including Guarantee Slipping as stipulated in this Annex. Both the Warranty Services and Guarantee Slipping shall be carried out locally in Hong Kong. If the Contractor appoints a local sub-contractor to perform the Warranty Services (hereinafter "local agent"), the Contractor shall ensure that the local agent appointed will perform the Warranty Services and Guarantee Slipping in full compliance with the requirements of the Contract including those as set out in this Annex 1. It must be emphasized that it is the Contractor's responsibility to ensure the Warranty Services and Guarantee Slipping are performed in full compliance with the terms of the Contract. The Contractor shall arrange their own technical staff with all the necessary skills, qualifications and experiences to conduct the services. Unless the technical staff from the local agent meet all these requirements, the technical staff from the local agent shall not provide the required Warranty Services but those technical staff from the Contractor to travel to Hong Kong for providing the Warranty Services. The Contractor shall provide the curriculum vitae of the local agent's engineers involved in providing the Warranty Services as part of the Deliverables to be provided as part of the Delivery Acceptance. The Government reserve the rights to reject any engineer whose qualification and experience are not acceptable to GNC and the Government reserves the right not to accept the Vessel.

1.2. The Government reserves all rights and claims against the Contractor in the event that any warranty claim has not been handled in accordance with the terms of the Contract including this Annex and the Detailed Procedures as mentioned in Paragraph 1.6 below. Furthermore, even it is agreed between the Government and the Contract after the necessary joint inspection and investigation that certain damage to the Vessel or any part thereof falls outside the scope of the Warranty Services, if so requested by the Government, the Contractor and its local agent shall still be responsible for the repair of such damage on the same terms as set out in this Annex 1 except that it shall be at the cost of the Government. Should the Contractor and its local agent refuse to do so or provide an unreasonable quotation of the repair cost, without prejudice to the rights and claims against them, the Government shall have the full right to appoint another contractor for the repair, and the Contractor agrees that the Warranty Period and the Warranty Services for the relevant Warranty Item(s) shall not be violated or affected notwithstanding such appointment.

1.3. For the Equipment in respect of which the manufacturer/supplier does not offer a one-year free warranty on such equipment, the Contractor shall provide the Warranty Services throughout the Warranty Period at the Contractor's own cost. For other loose equipment and installations, such as life-saving and firefighting equipment, etc., which are required to be serviced, inspected or renewed annually, the Contractor shall provide the servicing, inspection and renewal as per the manufacturer's requirements of that equipment or installation throughout the Warranty Period applicable to such items.

1.4. During the Warranty Period, when the Vessel or any part thereof is handed over for the Warranty Services and/or Guarantee Slipping, the Contractor shall be responsible for the collection and due return of the Vessel in good order (including all freight from and to the Government Dockyard and insurance (as further mentioned below)). Should there be any loss or damage of the Vessel or any Warranty Item (as defined in Paragraph 1.5 below) caused by any reason whatsoever while the Vessel is in the possession or control of the Contractor (including even when the Vessel is at the Government Dockyard or a maintenance base of the user department) or at the shipyard of the Contractor or an authorised agent appointed by it, the Contractor shall pay for the cost for the loss or damage plus 20% as and for liquidated damages but not as a penalty. Throughout the Warranty Period, notwithstanding anything to the contrary in the Contract, the Vessel and all Warranty Items are deemed to be at the Contractor's risks, and the Contractor shall insure and keep insured, at his own expense, a property insurance with the Government to be named as the sole payee, for an indemnity amount of not less than the purchase price of the Vessel plus 20% to protect the Government property against all risks. The Certificate of Insurance and evidence showing that the premium has been paid shall be available for inspection in advance. The Contractor shall provide this insurance policy before the commencement of the Warranty Services and/or Guarantee Slipping. Any excess payable under the insurance policy shall be borne by the Contractor.

1.5. Total Vessel Warranty

It is required that the Vessel is covered by the free of charge Warranty Services for one (1) year after the date of the issue of the unqualified Acceptance Certificate in respect of the Vessel. If there is more than one (1) Vessel, each such Vessel shall be covered in the aforesaid manner. The Warranty Services shall cover the entire Vessel and all its Equipment (including without limitation all Equipment specified in Schedules 6 and 7 in Part V and all Electronic Navigational Equipment as defined in relevant chapter(s) of Part VII), fittings and outfit and all Spare Parts (collectively, "Warranty Items") against defects in design, construction, workmanship or materials and against any non-compliance with any of the Product Warranties. The Warranty Services may be backed up by the Contractor using individual equipment suppliers/manufacturers' warranties but the Contractor shall remain solely liable to MD as a primary obligor to provide the Warranty Services regardless of the terms of the warranty including duration provided by such suppliers or manufacturers. Notwithstanding and without prejudice to the Contract on warranty obligations for the total Vessel, any individual equipment supplier/manufacturer's warranty extending beyond the one-year total Vessel warranty must be assigned to the Government as appropriate. In order not to violate the warranty of the engine(s), gearbox(es), propulsion system(s) and other major equipment, the Contractor shall also provide the corresponding periodic maintenance services based on the manufacturer(s)' manuals and recommendations within the Warranty Period at no extra cost to the Government.

1.6. Procedures for Warranty Claim

Without prejudice to the provisions of the Contract, detailed procedures for dealing with warranty claims must be proposed by the Contractor and agreed by MD before the issuance of the unqualified Acceptance Certificate of the Vessel ("Detailed Procedures"). These Detailed Procedures shall be agreed based on the following principles:

1.6.1. Any notification of claimed defect shall be sent from MD to the Contractor through a defined route.

1.6.2. There shall be a joint inspection and investigation to examine the defect and the Contractor shall propose the appropriate and necessary remedial action to the satisfaction of the Director.

1.6.3. The Contractor shall undertake on-site Warranty Services (including provision of all replacement Warranty Items, spare parts, labour, materials, test equipment, lifting, docking, and transportation) whether, at the option of the Government, the Vessel is berthed at the local agent's shipyard or in the Government Dockyard or maintenance bases of the user department. Taking the Vessel back to the shipyard of the Contractor (place of construction) should be avoided unless absolutely necessary.

1.6.4. Rectification of defects must have a minimum effect on the operation of the Vessel by the provision of on loan equipment if the anticipated repair time exceeds the time frame as specified in Paragraph 1.7.1 below. The proposed manner of the rectification must first be approved by the Government.

1.7. Throughout the Warranty Period, the Contractor shall be responsible for the provision of free of charge corrective maintenance and rectification of all defects in all and any of the Warranty Items including repair and replacement as necessary. This shall, at no cost to the Government, include Warranty Services to be performed by the Contractor described in the following sub-paragraphs:

1.7.1. To attend to the Vessel for inspection and repair within twenty-four (24) hours (excluding Hong Kong public holidays) of receiving the report of a fault ("fault report") and to take immediate action to rectify the defect after inspection. Unless otherwise agreed by the Government, all corrective maintenance and rectification must be effected within forty-eight (48) hours after the fault report is first issued. The MD must be informed of what corrective maintenance and rectification actions have been taken within seventy-two (72) hours of receiving the relevant fault report.

1.7.2. To provide all necessary transport, replacement Equipment, spare parts, labour and materials, tools and testing instruments required for the corrective maintenance and rectification.

1.7.3. Any replacement item or part to be deployed shall originate from the Warranty Spare Parts or otherwise from the manufacturer of the original Warranty Item to be repaired of the same model and with the same or better specifications and must be able to be found in the latest

spare parts list issued by such manufacturer. Alternative components shall not be used without the prior approval in writing of the MD.

1.7.4. If the Contractor fails to respond to any reported warranty claims within forth-eight (48) hours, the MD may arrange corrective maintenance and rectification of the defect either on its own or by deploying a third-party contractor as deemed appropriate with a view to minimising any downtime incurred. In such case, the Contractor shall compensate the Government for the full cost of such repairs plus 10% as and for liquidated damages but not as a penalty no later than ten (10) working days after a written demand has been served on the Contractor by MD. **Any such corrective maintenance and rectification of the defect completed by MD on its own or by another third-party contractor shall not relieve the Contractor from its obligations under the Contract including those in respect of the remainder part of the Warranty Period (including all extensions). The Warranty Period shall not be affected or broken due to such course of action.**

1.8. Extension of Warranty

1.8.1. The Warranty Period for any Warranty Item shall be extended for such duration whilst the Contractor has failed to repair and correct satisfactorily the defects in such Warranty Item exceeding seven (7) working days counting from the date when the relevant fault report was first issued (or otherwise exceeding such longer permissible repair duration of more than seven (7) working days as the Government considers appropriate depending on the warranty claim) (and depending whichever is applicable, this is the "permissible repair time").

1.8.2. Warranty Items which are replaced during the Warranty Period shall have a new warranty period of one (1) year commencing from the date of replacement including the replacement as mentioned in Paragraph 1.9 below.

1.8.3. Equipment which is found to be defective during the trials at the Guarantee Slipping as mentioned in Paragraph 2.2.5 below shall have an extension of warranty of one (1) year.

1.8.4. The Warranty Period of the Vessel shall be extended if the entire Vessel is out of service for more than twenty-four (24) hours in excess of the permissible repair time as mentioned in paragraph 1.8.1 above due to any failure in any Warranty Item and this extension will count from the date when the relevant fault report was first issued until the rectification of such fault. For the avoidance of doubt, this paragraph 1.8.4 shall apply if due to any failure the Vessel has to be put out of service. It is only if the Vessel would not be put out of service notwithstanding any failure that there shall only be extension of the relevant Warranty Item but not the entire Vessel under paragraph 1.8.1.

1.8.5. In relation to a Warranty Item with extended Warranty Period as mentioned in Paragraph 1.8.1 and/or 1.8.2 and/or 1.8.3 and/or 1.8.4 above, depending on whichever is applicable, all references to Warranty Period in the Contract shall be construed to include such extended Warranty Period. For the avoidance of doubt, in the case of paragraph 1.8.4 above, the entire Vessel and all Warranty Items installed therein shall be given an extended Warranty Period in accordance with that paragraph.

1.9. Recurrent Defects

During the Warranty Period, should a second and similar defect arise in relation to a Warranty Item, this shall be construed as conclusive evidence of the Warranty Item's unsuitability for the purpose intended, and the Contractor shall take immediate steps to conduct a thorough investigation jointly with MD at the Contractor's expense, to ascertain the reasons for any such defect and shall forthwith at the MD's option and the Contractor's expense, procure and deliver another replacement Warranty Item with a new design suitable for the purpose intended to replace the original defective Warranty Item.

1.10. In the event that the Contractor proposes to modify any Warranty Item or any part of the Vessel in order to repair or replace the same or another Warranty Item, the Contractor shall obtain the Government's advance written consent to the proposed modification.

1.11. Throughout the Warranty Period, the Contractor shall in respect of the first Vessel to be delivered maintain an inventory of spare parts, which shall be brand new items fresh from the factory serving as spare parts of the items as listed in Schedules 6 and 7 in Part V (and complying with the same Overall Specifications as applicable to these items) and in the quantity as found in one Vessel with its local agent in Hong Kong which the Contractor shall use for performing the Warranty Services (viz., Warranty Spare Parts). The Government will not provide its own inventory of the Spare Parts to the Contractor for the provision of the Warranty Services.

1.12. Updated/Upgraded Information

It is expected that during the Warranty Period certain Warranty Items may be modified or changed. All documentation affected by this change must be updated to reflect the new situation. All the support documentation such as the Vessel inventory list, job information and maintenance scheduling in relation to these modifications and changes shall be provided at the expiry of the Warranty Period.

1.13. Warranty of Electronic Navigational Equipment

On top of the Warranty Services described in this Annex 1, there are also service specifications of the Warranty Services set out in relevant chapter(s) of this Part VII for the Electronic Navigational Equipment. In the event of any inconsistency, the better service specifications shall prevail. Please refer to the relevant chapter(s) of this Part VII.

2. Guarantee Slipping

2.1. As stated in the section "Warranty" above, Guarantee Slipping shall be carried out at the end of the original Warranty Period (but if there is any extension of the Warranty Period for the entire Vessel, GNC has right to decide if the time of Guarantee Slipping should be upon the expiry of the original Warranty Period before any extension or upon the expiry of the extended Warranty Period).

2.2. At the Guarantee Slipping, the Contractor shall carry out the following work and provide all necessary materials, spare parts, labour and equipment in order to carry out such work:

2.2.1. Pre-guarantee slipping inspection and trial

(a) Joint inspection with trial to confirm the list of guarantee slipping items; and
(b) Collect vessel performance information beforehand for comparing when guarantee slipping completion.

2.2.2. Engines and Gearboxes

(a) Renew the lubricating oil and replace the filters for the outboard engines and gearboxes and top up the engine coolant (if applicable) as per the manufacturer's recommendations;
(b) Clean all the engine air filters and change the filter elements;
(c) Change all fuel/water separators elements and fuel filters for all engines;
(d) Flush through the cooling system of the outboard engines and gearboxes and renew all zinc anodes if provided;
(e) Check all the engines' belts and adjust or renew if necessary;
(f) Check tappet clearances for the inlet and exhaust valves, ignition timing and idle speed and adjust if necessary;
(g) Conduct function tests for the engines' protection system and their associated sensors, gauges and other measuring devices;
(h) Disconnect and remove all engines and gearboxes sea water pipes (suction & discharge) for inspection, and clear off marine growth and obstructive materials in all pipes and fittings;
(i) Repair all damages and leakages in the pipelines; and
(j) Any other work required or recommended by the engine manufacturer.

All of the work listed at Paragraphs 2.2.2(a) to (i) shall be carried out by the manufacturer's authorised agent/dealer. All the work procedures and the spare parts used shall comply with the manufacturer's specifications and requirements.

2.2.3. Hull and Deck Items (where applicable):

(a) Paint Under the Water Line

(i) Paint under the water line shall be checked by the paint manufacturer's representative for the effectiveness of one (1) year's protection against marine growth;
(ii) The hull shall be cleaned and ready for inspection of paint damage;
(iii) Damaged paint shall be repaired according to the paint/gelcoat manufacturer's procedures;
(iv) After the repair of the damaged paint as specified at Paragraph 2.2.3(a)(iii) above, two coats of touch up primer and one (1) coat of touch up shall be applied; and
(v) One touch up anti-fouling paint of finishing coat shall be applied to the damaged paint as specified at Paragraph 2.2.3(a)(iii) above.

(b) Paint Above the Water Line

(i) Damaged paint on the hull above the water line and deckhouse shall be repaired properly. After repair, two (2) coats of touch up primer and one coat of touch up (finishing) shall be applied;
(ii) Two (2) coats of paint shall be applied on the Vessel's name, draft marks and insignia; and
(iii) One (1) full coat of anti-slip paint shall be applied to the open and side deck.

(c) Inspect, clean and polish propellers/waterjet impellers
(d) Inspect, clean and remove obstructed object on the propulsion shaft
(e) Free, clean, grease and recondition all moving parts of the deck fittings, i.e. WT (water tight) hatches, vent covers, rollers and fairleads and anchor chain stoppers, etc
(f) Renew all zinc anodes
(g) Life-saving appliances ("LSA") and Fire-fighting appliances ("FFA") must be serviced and re-certified as required. (Free, clean, grease and recondition all fire control valves, hydrants and bilge suction and control valves)
(h) Free, clean and repaint the anchor chain and swivel set
(i) Remove the fuel tank(s) from the fuel tank compartment(s). all fuel tanks shall be pressure-tested free of leakage, while the hull structures in the fuel tank compartment should inspected correct; and
(j) In order to facilitate GNC/HKPF officers carrying out any inspections (if any found necessary) inside the under-deck compartments (including but not limited to visual inspections, non-destructive tests to the welding beams, etc), open up all the compartment hatches & inspection doors and remove the fuel oil tank(s) from vessel. Prepare and obtain a gas free certificate issued by approved person according to local regulation. Restore the fuel system afterward.

2.2.4. Mechanical & Electrical

(a) Dismantle all overboard valves for inspection and renew the defective parts;
(b) Check and clean the sea water system (including the grating, sea chest internal, sea suction and strainers) complete with renew their zinc anodes;
(c) Each of the compartment bilge suction to be checked and free of rubbish;
(d) Generator megger test and electrical circuit earth leak test;
(e) Electric cables and pipes penetration inspection; and
(f) Batteries condition check and switch over test.

2.2.5. The following shall be tested at the dock trial / sea trials as part of the Guarantee Slipping:

(a) Engine control and steering system including emergency/alternative method;
(b) Engine alarm and shut down function (including emergency stopping of engines at wheelhouse);
(c) Functional test of fuel supply emergency shutdown devices;
(d) Navigational equipment, lights and sound signals;
(e) Ahead and astern running and crash stop test;
(f) Steering trial;
(g) Speed measurement;
(h) Bilge system function (including high level bilge alarm system);
(i) Fire pump(s) function (including fire detection system, alarms, ventilation fans /fuel pump remote shutdown);
(j) Other trials or testing of equipment as required by the Government Representative;
(k) Any item or component found defective shall be repaired or replaced;
(l) The Dock Trial and Sea Trial Safety Checklist items, as listed below:

Dock Trial Check List

General items will be checked during dock trial	
1.	Engines start and stop testing
2.	Engines emergency stop check
3.	Engines speed and clutch unit testing
4.	Engines speed high and low idle speed testing
5.	Engines gauges and alarm check
6.	Propulsion system testing
7.	Anchor testing
8.	Navigation lights testing
9.	Vessel horn testing and windows screen wipers testing
10.	Fire protection system check
11.	Portable fire extinguishers inspection
12.	Life-saving equipment inspection
13.	Signal and light testing
14.	Engine room ventilation fans testing
15.	Engine room ventilation fans testing
16.	Air handling unit and air conditioning system testing
17.	A/C cooling water pumps testing
18.	Bilge system in each compartment testing.
19.	Floor plate inspection
20.	Cabin lights testing
21.	Fuel tanks quick closing valves testing
22.	G.S. pumps testing

23.	Fire pumps testing
24.	Tailshaft cooling water pumps testing (if applicable)
25.	Bilge pumps testing
26.	Fuel oil pumps testing
27.	Waste water pumps testing
28.	Steering system power assisted and manual operation testing
29.	Emergency steering operation check
30.	Sanitary pumps testing
31.	Sewage pumps testing
32.	Fresh water pumps testing

Sea Trial Safety Check List

General items will be checked during sea trial	
1.	Engines start and stop testing
2.	Engines emergency stop check
3.	Engines speed and clutch unit testing
4.	Vessel horn testing and windows screen wipers testing
5.	Portable fire extinguishers are in place
6.	Life jackets and life buoys are in place
7.	Sea trial navigation flag hoisted
8.	Telecommunication system function check
9.	Approved coxswains are in control
10.	Sufficient fuel oil to perform the full course of sea trial

(m) Other trials or testing of equipment as required by the Government Representative; and

(n) Any item or component found defective shall be repaired or replaced.

2.3. After Guarantee Slipping, the Contractor shall submit the above works completion report (including engines trial/testing report completed with engines parameters) to the Government Representative.

Part VII - Annex 2 - Implementation Timetable

Item No.	Milestone	Completion Date
1	Issuance of "Notification of Conditional Acceptance"	To be advised after Tender Evaluation
2	Contract Date (the date of the Contract appearing at the Articles of Agreement)	The date when the last party signs the Articles of Agreement. The Government will not sign the Articles of Agreement until and unless the Contractor fulfils all of the conditions precedent as specified in Clause 25.2 of Part II - Conditions of Tender (save to the extent waived by the Government, if any)
3.	The Contractor shall submit the following in accordance with Clauses 11.1 and 11.2 of Part IV (a) An Implementation Timetable, in the form set out in Annex 2 to the TS, setting out the major milestones and their scheduled completion dates and incorporating the Delivery Dates specified in Schedule 2 of Part V; (b) The Drawing Submissions Timetable in the form set out in Annex 3 to the TS; and (c) The Main Items Inspection Timetable in the form set out in Annex 4 to the TS.	Within fourteen (14) days from the Contract Date
4	Kick-Off Meeting	To be held within three (2) months after the Contract Date at the Government Dockyard or the Contractor's Shipyard to be determined by the Government

5	Submission of all drawings as listed in Annex 3 to Part VII	Two (2) months from the Contract Date
6	Completion of design with RO/RA's approval and GNC approval	
7	Completion of hull structure of the Vessel	The Contractor shall propose the completion dates of Milestones **[7] to [16]** for each of the Vessels as specified in Schedule 2 of Part V for GNC's approval
8	Completion of installation of propulsion and lift systems	
9	Completion of installation of ENE	
10	Launching of the Vessel	
11	Conduct of all tests, inspections and trials as part of Stage 1 of the Technical Acceptance as described in paragraph 1.8.1 of Part VII	
12	Shipment to Hong Kong	
13	Conduct of all tests, inspections and trials as part of Stage 2 of the Technical Acceptance to be performed in Hong Kong Waters as described in paragraph 1.8.2 of Part VII	
14	Conduct of all tests, inspections and trials as part of Stage 3 of the Technical Acceptance to be performed in Hong Kong Waters as described in paragraph 1.8.3 of Part VII	
15	Conduct Stage 4 of the Technical Acceptance as described in paragraph 1.8.4 of Part VII	
16	The date when the Vessel shall be Ready for Use	

Part VII - Annex 3 - Drawings Submission Timetable

Item No.	Drawings Approval	Completion Date
1	General Arrangement Plan	*All the drawings are required to be submitted within two (2) months after the signing of Articles of Agreement for GNC's approval / reference.*
2	Lines Plan	
3	Stability Analysis & Calculations	
4	Inclining Experiment Report (if applicable)	
5	Engine Mounting Arrangement	
6	Power / Speed Estimation and Curve	
7	Intact and Damaged Stability Plan	
8	Details of Electronic Navigational / Communication Equipment	
9	Details of Deck Equipment, Outfitting, Furniture, etc.	
10	Details of Engines' Arrangement	
11	Consoles Arrangement and Schematic Diagram	
12	Instrumentation and Control System	
13	Calculation of Fuel Capacity	
14	Details of Electrical and Electronic Equipment	
15	Electrical Load Calculations	
16	Schematic Layout of Electrical Circuits	
17	Paint Schedule	
18	Lightning Protection Arrangement	
19	Torsional Vibration Calculation (if applicable)	
20	Others as required	

Note: All information to be submitted shall show compliance of the relevant Equipment or the Vessel or any part thereof with all requirements of the Contract.

Part VII - Annex 4 – Main Items Inspection Timetable

VESSEL NAME: _____			Inspection date	Outstanding / Reinspection / Remarks
Item	Items to be Inspected			
	Hull Structure, Layout and Outfitting Inspection			
H-1	Mould lofting			
H-2	Construction materials – Fiberglass / GRP for hull and superstructure			
	a) Mould checking for hull and superstructure			
	b) Material such as fibre glass and gelcoat certificates			
H-3	Material and Quality Assurance verification			
H-4	Keel laying for hull			
H-5	Fabrication of hull up to main deck in stages of work, including:			
	a) Alignment			
	b) Edge preparation			
	c) Workshop inspection			
	d) Workmanship			
	e) Compliance with approved plans			
	f) Inspection and Examination			
	g) Hull internal work inspection			
	h) Plating thickness gauging			
	i) Skirt			
H-6	Engine bearers fabrication			
H-7	Console scantling checking			
H-8	Pressure tests of tanks			
	Fuel oil tank			
	a) Tank construction (internal/external/fitting)			
	b) Tank pressure test			
H-9	Hose test for hull & superstructure			
H-10	Mock up inspection			
H-11	Installation of various outfitting items			
	a) Anchor and chain/rope			
	b) Seating of heavy equipment and masts			
	c) Installations and function tests of shock-mitigating seats			
	d) Installation and leak tests of shipside valves			
	e) Inspection and load test of all lifting arrangement, including but not limited to:-			
	(i) lifting devices;			
	(ii) strong points;			
	(iii) mooring bitt; and			
	(iv) accessories			
H-12	Function tests of various outfitting items			
H-13	Watertightness or weathertightness of openings			
	a) Manholes			
	b) Hatches			

	c) Air pipes			
H-14	Painting inspection of different layers			
H-15	Draught marks and vessel dimensions verifications			
H-16	Arrangement of consoles			
H-17	Lightning protection system			
	a) Installation of lightning protection system			
H-18	Inspection of fire, heat and sound insulation (if applicable)			
	a) Fire insulation			
	b) Heat insulation			
	c) Sound insulation			
H-19	Interior furnishings			
	a) Console area			
H-20	Lifesaving appliance			
H-21	Fire-fighting appliance			
H-22	Lightship weight measurement			
H-23	Inclining experiment test / in-air stability test			
H-24	Pre-shipment Handling assessment and Inspection			
H-25	Sea trials including operation test of outfitting equipment			
H-26	Site towing functioning test and demonstration trial of anchor			
H-27	Cleanliness inspection before acceptance			
H-28	Inventory check in the HKSAR			
H-29	Acceptance and delivery			
H-30	Acceptance of As-Fitted drawings and Engine/Equipment manuals and Documentation			

VESSEL NAME: _____			Inspection date	Outstanding / Reinspection / Remarks
Item	Items to be Inspected			
Electrical and Machinery Installation				
EM-1	General inspection on installation of machinery:			
	a) General inspection on installation of propulsion (thrust) engine and lift engine			
EM-2	Propulsion (thrust) engine and lift engine:			
	a) Test of engine safety devices and alarms			
EM-3	Fuel oil system:			
	a) General inspection & dimension checking of fuel oil system			
	b) Fuel oil tank low level alarm test			
	c) Fuel oil tank final cleaning/internal inspection before filling			
	d) Fuel oil tank high level alarm test			
	e) Fuel oil tank content gauge calibration and test			
	f) Inspection of piping penetration of bulkhead and deck			
	g) Hydraulic test of fuel oil piping			

	h) Water-in-fuel sensor(s) test			
EM-4	Bilge system:			
	a) General inspection & dimension checking of bilge system			
	b) Inspection of piping penetration of bulkhead and deck			
	c) Hydraulic test of piping			
	d) Functional test of bilge system			
EM-5	Functional test of drainage system			
EM-6	Batteries:			
	a) Inspection of battery connectors and housing boxes			
	b) Inspection of battery charger			
	c) Operational test of battery charger Test of outboard engines and generator consecutive starting by each group of battery (start/stop at remote and local control)			
EM-7	Electrical installation:			
	a) Inspection of lightning conductor			
	b) General inspection of cable layout, insulation and cable sizes			
	c) Inspection of cable penetrations of bulkhead and deck			
	d) Inspection of transformers / circuit breaker			
	e) Inspection of tally plates			
EM-8	Main switchboard & panels (if applicable):			
	a) Main switchboard & panels - high voltage injection test			
	b) Cable size checking of electrical switchboard installations			
	c) Inspection of DC distribution panel			
	d) Megger test of the electrical system			
	e) Earthing test of the electrical system			
EM-9	Primary Control console:			
	a) Inspection of control console including checking of weathertightness			
	b) Functional test of console controls			
	c) Inspection of navigation equipment control panel			
	Secondary Control console			
	d) Inspection of control console including checking of weathertightness			
	e) Functional test of console controls			
	f) Inspection of navigation equipment control panel			
EM-10	Lighting:			
	a) Inspection and functional test of general lighting			
	b) Inspection and functional test of emergency lighting including capsize lights			
	c) Inspection and functional test of floodlight installation			
	d) Inspection and functional test of searchlight installation			
EM-11	Navigational lights and signals			
	a) Inspection and functional test of navigational lights			
	b) Test of horn/whistle/siren			
EM-12	Electronic equipment tested by COMMS			
EM-13	Test of noise level during sea trial			

	Operational System			
OS-1	Installation inspection and functional test for Operational Systems			
OS-2	Inspection of tally plate and cable label			
OS-3	Inspection of space, cables and power reservation for other HKPF provided equipment e.g. MARSAS, radio terminals and others.			
OS-4	Function and performance test during Sea Trial			

Part VII - Annex 5 – Vessel Condition During Respective Sea Trial

1) Official Speed Trial

Conditions at Speed-Trial		
1	Person on board	3 Persons (at 82.5 kg per person including effect)
2	Fuel oil tanks	not less than 90% fuel tank capacity
3	Fresh water tank	not applicable
4	Store/Utilities/Dummy weight	Top up to Payload at 280 kg
5	Sea Conditions	Maximum wave height of less than 0.3 m

2) Endurance and Performance Test

Conditions at Endurance and Performance Test		
1	Person on board	3 Persons (at 82.5 kg per person including effect)
2	Fuel oil tanks	not less than 90% fuel tank capacity
3	Fresh water tank	not applicable
4	Store/Utilities/Dummy weight	Top up to Payload at 280 kg
5	Sea Conditions	Maximum wave height of less than 0.3 m

3) Manoeuvrability Test

Conditions at Manoeuvrability Test		
1	Person on board	3 Persons (at 82.5 kg per person including effect)
2	Fuel oil tanks	not less than 90% fuel tank capacity
3	Fresh water tank	not applicable
4	Store/Utilities/Dummy weight	Top up to Payload at 280 kg
5	Sea Conditions	Maximum wave height of less than 0.3 m

4) Crash Stop Test / Astern Running Test

Conditions at Crash Stop Test / Astern Running Test		
1	Person on board	3 Persons (at 82.5 kg per person including effect)
2	Fuel oil tanks	not less than 90% fuel tank capacity
3	Fresh water tank	not applicable
4	Store/Utilities/Dummy weight	Top up to Payload at 280 kg
5	Sea Conditions	Maximum wave height of less than 0.3 m

Part VII - Annex 6 – Endurance and Performance Tests

Date of Test:		Place of Test:	
Vessel's Identification:		Vessel's Name:	

Conditions at Endurance and Performance Test			
Person On board	**3**	Payload*	**280 kg**
Fuel (Petrol)	**90%**	Other Equipment	**20 kg**
Sea Conditions	**Maximum wave height of less than 0.3m**		

Engines:	**Propulsion**	**Lift**	**Fan/Propeller:**	**Propulsion**	**Lift**
Maker			Maker		
Type			Type		
Serial Number			Diameter		
Rated Power			Pitch		
Rated Speed			Direction of Rotation		

Engine Load	**Engine Speed (rpm)**	**Vessel Speed (Knots)**	**Time (Start)**	**Time (Finish)**	Fuel Consumption (litres/minutes)	Engine Oil Pressure (Bar)	Engine (in) CW Temp. (°C)		Others
__% of Rated Power	At Minimum Crushing Speed		>15 min						
100% of Rated Power (Endurance Test)			60 min						
		Remarks:							

Witness by:	MD Representative	Shipyard Representative

* Remarks: Payload to be topped up to 280 kg.

Part VII - Annex 7 – As-Fitted Drawings and Documents

As-fitted Drawings and Machinery/Equipment documents and information literature to be delivered to the Government at Delivery Acceptance

1 As-Fitted Drawings

1.1 At not less than six (6) weeks before the delivery acceptance of each Vessel, the Contractor shall deliver to the Government four (4) hard copies and two (2) soft-copies in .pdf and .dwg (where applicable) files of the following plans and drawings that contain the technical information of that Vessel and its machinery and equipment as they are when the Vessel is on the day accepted by the MD. These are termed the final version of the "As-Fitted" Plans and Drawings, and they must consist of the following ones as well as any other additional ones that may be required by GNC/MD during the design and construction of the Vessel and before the Vessel is accepted by the Government.

1.2 The As-Fitted Plans and Drawings shall be prepared by professional ship draughtsmen and they shall be prepared in the professional manner, scale, size and style normally required of in the ship design and construction business sector. All plans and drawings shall show and be clearly marked with the profile, plan, and section views of the layout, arrangement details, and construction details in the manner required by GNC officer.

1.2.1 General Arrangement Plan.

1.2.2 RO/RA approved stability information booklet and the inclining experiment report (if applicable).

1.2.3 Hydrostatics, cross curves and stability calculations for all ship loading conditions specified in the Technical Specifications.

1.2.4 Vessel subdivision drawings and stability calculations.

1.2.5 Painting scheme of the whole Vessel.

1.2.6 Vessel draught marking diagram. (if applicable)

1.2.7 Equipment layout diagram.

1.2.8 Hull structural construction and hull scantlings drawings.

1.2.9 Hull shell and frames and the framings arrangement and construction plan.

1.2.10 Steering system and steering arrangement diagrams. (if applicable)

1.2.11 Deckhouse and deck structural and construction plan.

1.2.12 Hull watertight bulkheads construction plan.

1.2.13 Deckhouse to deck connection detailed construction plan.

1.2.14 Deck edge details and construction plan, including detailed structural arrangement drawings of hull to deck connection.

1.2.15 Detailed cathodic corrosion prevention and arrangement plans and drawings for the Vessel throughout.

1.2.16 Mast structural and construction plan and mast equipment arrangement plan.

1.2.17 Anchoring arrangement plan.

1.2.18 Piping diagrams for fuel oil, freshwater, bilge, firefighting, scuppers and drains, sewage system (as applicable).

1.2.19 Fire prevention, fire control and firefighting system drawings.

1.2.20 Drawings of the main switchboard and all other switchboards and the electrical system (if applicable).

1.2.21 Electrical Load Calculation.

1.2.22 Electrical installation drawings.

1.2.23 Details of the Operational Systems.

1.2.24 Propulsion and lift engines and generator sets arrangement and siting plans and drawings of their fuel lines and exhaust gas piping and arrangement (if applicable).

1.2.25 Main fuel oil tank drawing and its associated piping and manifold(s), and filling, overflow and ventilation system.

1.2.26 Drawings of the anchor and the anchoring system.

1.2.27 Lifesaving appliance arrangement plan and fire safety plan.

1.2.28 Distress signals, alarm systems, and internal/external communication arrangement and system plan.

1.2.29 Navigation lights, sound and signal diagrams and any other external lighting arrangement plan.

1.2.30 Vessel overall lighting arrangement and light control plan.

1.2.31 Vessel alarm and signals, internal communication systems and public address systems plan.

1.2.32 General layout and arrangement drawing of the air-conditioning system.

The lists are not exhaustive, additional as-fitted drawings may be added if required.

1.3 Documents to be provided by the Contractor

1.3.1 In not less than one month before the Delivery Acceptance of the Vessel, the Contractor shall provide for GNC's acceptance a list of all documents to be provided.

1.3.2 A Certificate of Compliance ("COC") shall be issued to certify the Vessel in compliance with the Hovercraft Code or equivalent. A sample COC is shown in paragraph 2 of this Annex 7.

1.3.3 When the Vessel is delivered to the Government Dockyard, the Contractor shall deliver to the Government all the technical information, leaflets, literature, manuals and booklets, etc. and whatsoever items that are necessary for the operation, handling, services, maintenance, spare parts, repairs and the technical understanding of any one of all the engines, machinery, motors, pumps, equipment, fittings and outfitting items of the Vessel.

2 Sample Certificate of Compliance for the Vessel

Certificate of Compliance	
Name of Recognised Organisation ("RO") / Relevant Authority ("RA")	
Certificate of Compliance Issued by [*Name of RO / RA*] that the Vessel has been constructed to comply with the construction standards of The Hovercraft Code published by the Maritime Coastguard Agency, UK or equivalent [*Name of the Standards*].	
Name of the Vessel:	Date of Build:
Official Number:	
Vessel Hull ID No.:	
Length (Hard Structure Length) (m):	Hard Structure Breadth (m):
Hovercraft Group under the Hovercraft Code: [Ultra-Light / Light / Small / others]	The Vessel Use:
This is to certify that the above named Vessel was examined by [*Name of authorised person*] of [*Name of RO / RA*] at [*Place of Survey*] on [*Date of Survey*] and found to be in compliance with the requirements of [The Hovercraft code published by the Maritime Coastguard Agency UK or equivalent] [*Name of the Standards*].	
Anniversary Date of the Certificate:	[*Anniversary date*]
The permitted area of operation is	[*Area Category*]
Maximum No. of persons to be carried:	[*No.*]
Maximum all up weight including persons and equipment:	[*KG*]
Maximum cargo weight (if applicable):	[*KG*]
This certificate will remain in force until [*Expiry date*] subject to the Vessel, its machinery and equipment being efficiently maintained, annual examinations and manning complying with [The Hovercraft code published by the Maritime Coastguard Agency, UK or equivalent] [*Name of the Standards*], and to the following conditions [*Conditions*]. Issued at [*Place of issue*] On [*Date of issue*] For and on behalf of [*Name of RO / RA*] Name: [*Name of person issuing Certificate on behalf of the RO / RA*] Signature: [*Signature of person issuing Certificate on behalf of the RO / RA*]	

Part VII - Annex 8 – Definition of Waves and Sea

Beaufort scale number	Description	Wind speed	Wave height	Sea conditions	Land conditions
0	Calm	< 1 km/h (< 0.3 m/s) < 1 mph < 1 knot < 0.3 m/s	0 m 0 ft	Flat.	Calm. Smoke rises vertically.
1	Light air	1.1–5.5 km/h (0.3–2 m/s) 1–3 mph 1–3 knot 0.3–1.5 m/s	0–0.2 m 0–1 ft	Ripples without crests.	Smoke drift indicates wind direction. Leaves and wind vanes are stationary.
2	Light breeze	5.6–11 km/h (2–3 m/s) 4–7 mph 4–6 knot 1.6–3.4 m/s	0.2–0.5 m 1–2 ft	Small wavelets. Crests of glassy appearance, not breaking	Wind felt on exposed skin. Leaves rustle. Wind vanes begin to move.
3	Gentle breeze	12–19 km/h (3–5 m/s) 8–12 mph 7–10 knot 3.5–5.4 m/s	0.5–1 m 2–3.5 ft	Large wavelets. Crests begin to break; scattered whitecaps	Leaves and small twigs constantly moving, light flags extended.
4	Moderate breeze	20–28 km/h (6–8 m/s) 13–17 mph 11–16 knot 5.5–7.9 m/s	1–2 m 3.5–6 ft	Small waves with breaking crests. Fairly frequent whitecaps.	Dust and loose paper raised. Small branches begin to move.
5	Fresh breeze	29–38 km/h (8.1-10.6 m/s) 18–24 mph 17–21 knot 8.0–10.7 m/s	2–3 m 6–9 ft	Moderate waves of some length. Many whitecaps. Small amounts of spray.	Branches of a moderate size move. Small trees in leaf begin to sway.
6	Strong breeze	39–49 km/h (10.8-13.6 m/s) 25–30 mph 22–27 knot 10.8–13.8 m/s	3–4 m 9–13 ft	Long waves begin to form. White foam crests are very frequent. Some airborne spray is present.	Large branches in motion. Whistling heard in overhead wires. Umbrella use becomes difficult. Empty plastic bins tip over.
7	High wind, moderate gale, near gale	50–61 km/h (13.9-16.9 m/s) 31–38 mph 28–33 knot 13.9–17.1 m/s	4–5.5 m 13–19 ft	Sea heaps up. Some foam from breaking waves is blown into streaks along wind direction. Moderate amounts of airborne spray.	Whole trees in motion. Effort needed to walk against the wind.
8	Gale, fresh gale	62–74 km/h (17.2-20.6 m/s) 39–46 mph 34–40 knot 17.2–20.7 m/s	5.5–7.5 m 18–25 ft	Moderately high waves with breaking crests forming spindrift. Well-marked streaks of foam are blown along wind direction. Considerable airborne spray.	Some twigs broken from trees. Cars veer on road. Progress on foot is seriously impeded.
9	Strong gale	75–88 km/h (20.8-24.4 m/s) 47–54 mph 41–47 knot 20.8–24.4 m/s	7–10 m 23–32 ft	High waves whose crests sometimes roll over. Dense foam is blown along wind direction. Large amounts of airborne spray may begin to reduce visibility.	Some branches break off trees, and some small trees blow over. Construction/temporary signs and barricades blow over.

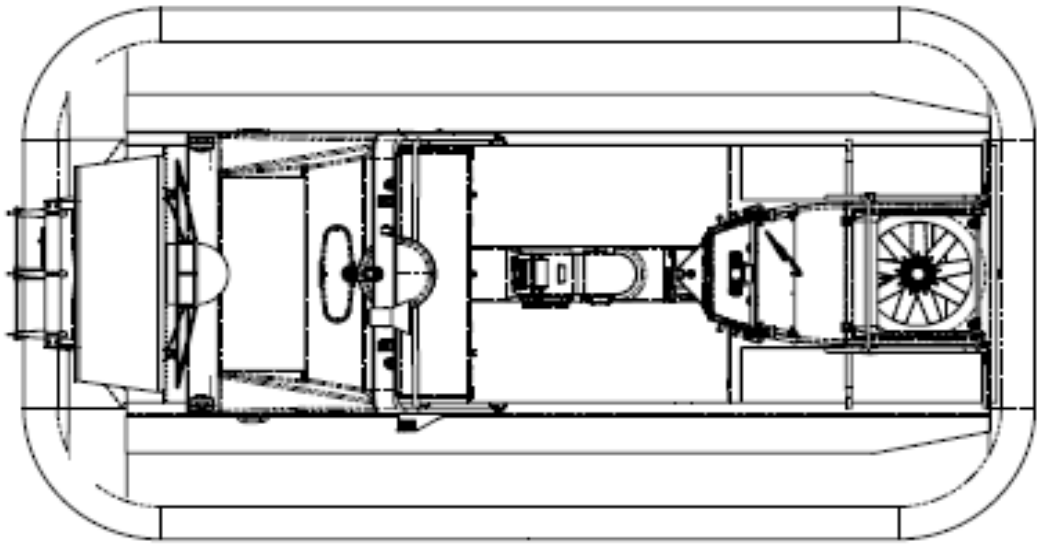
10	Storm, whole gale	89–102 km/h (24.7-28.3 m/s) 55–63 mph 48–55 knot 24.5–28.4 m/s	9–12.5 m 29–41 ft	Very high waves with overhanging crests. Large patches of foam from wave crests give the sea a white appearance. Considerable tumbling of waves with heavy impact. Large amounts of airborne spray reduce visibility.	Trees are broken off or uprooted, saplings bent and deformed. Poorly attached asphalt shingles and shingles in poor condition peel off roofs.
11	Violent storm	103–117 km/h (28.6-32.5 m/s) 64–73 mph 56–63 knot 28.5–32.6 m/s	11.5–16 m 37–52 ft	Exceptionally high waves. Very large patches of foam, driven before the wind, cover much of the sea surface. Very large amounts of airborne spray severely reduce visibility.	Widespread damage to vegetation. Many roofing surfaces are damaged; asphalt tiles that have curled up and/or fractured due to age may break away completely.
12	Hurricane	≥ 118 km/h (≥ 32.8 m/s) ≥ 74 mph ≥ 64 knot ≥ 32.7 m/s	≥ 14 m ≥ 46 ft	Huge waves. Sea is completely white with foam and spray. Air is filled with driving spray, greatly reducing visibility.	Very widespread damage to vegetation. Some windows may break; mobile homes and poorly constructed sheds and barns are damaged. Debris and unsecured objects are hurled about.

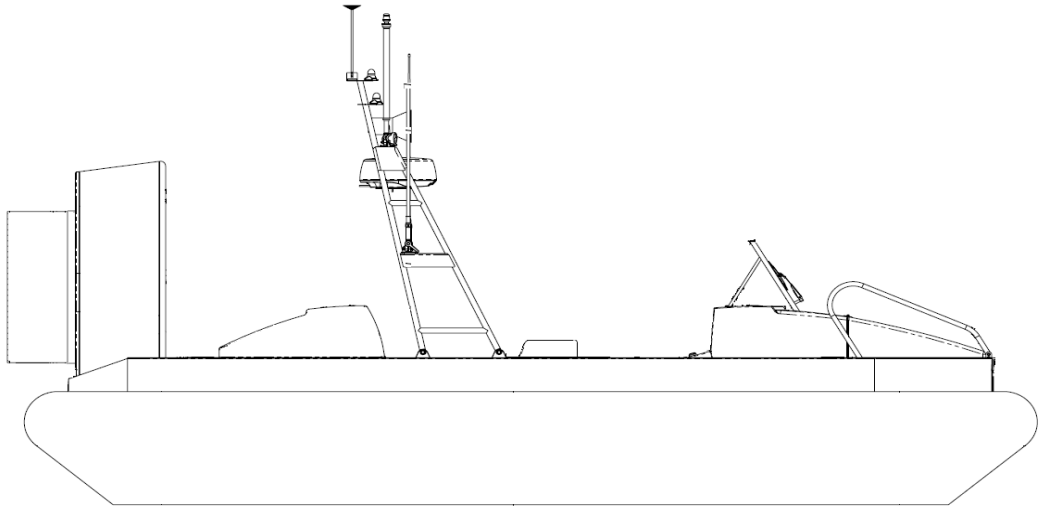
World Meteorological Organization (WMO) Sea State Code		
Sea State Code	Wave Height (meters)	Characteristics
0	0	Calm (glassy)
1	0 to 0.1	Calm (rippled)
2	0.1 to 0.5	Smooth (wavelets)
3	0.5 to 1.25	Slight
4	1.25 to 2.5	Moderate
5	2.5 to 4	Rough
6	4 to 6	Very rough
7	6 to 9	High
8	9 to 14	Very high
9	Over 14	Phenomenal
Character of the Sea Swell		
	0. None	
Low	1. Short or average 2. Long	
Moderate	3. Short 4. Average 5. Long	
Heavy	6. Short 7. Average 8. Long	
	9. Confused	

Part VII - Annex 9 – List of Recognised Organisations

Acronym	Name
ABS	American Bureau of Shipping
BV	Bureau Veritas SA
CCS	China Classification Society
DNV	DNV AS
KR	Korean Register
LR	Lloyd's Register Group Limited
NK	Nippon Kaiji Kyokai
RINA	RINA Services S.p.A.
RS	Russian Maritime Register of Shipping

Part VII - Annex 10 – Conceptual General Arrangement Plan





Length Overall:	5.0 metres
Extreme Breadth:	2.6 metres
Maximum Height :	2.1 metres
Depth (mould):	0.9 metre
Design Draft:	0.5 metre;
Maximum Payload:	280 kg
Maximum No. of people onboard:	3 persons

Part VII - Annex 11 – Not Used

Part VII - Annex 12 – Tenderer's Presentation

1. General

1.1 The Tenderers, which have passed the Stage 1 and 2 of the Tender Evaluation Procedures, are required, at the discretion of the Government and at their own costs and expenses, to make a verbal presentation of their proposals to the Government Representatives within twenty-one (21) calendar days upon notice. The presentation shall be conducted by a team of qualified persons who are authorized by the Tenderer. In person face-to-face presentation is preferred, which should be held at Government premises as designated by the Government Representatives as far as practicable. Presentation by way of video conference may also be considered at the Government's discretion.

1.2 The Tenderer shall introduce, explain and clarify their tender proposals during the presentation. In no circumstances should additional information or new/amended proposal not set out in their tender submissions be accepted. Tender assessment will be made solely based on the Technical Proposal submitted before the Tender Closing Date. The presentation will **not** be taken into account in marking under the Marking Scheme in Annex D to Part II – Conditions of Tender.

1.3 The Tenderer shall focus on presenting the Technical Proposal submitted in respect of its proposed design and solutions to be adopted, Counter-Proposals as well as the Excess Proposals therein involving higher standard of specifications and proposed innovative suggestions, if applicable. The scope of presentation shall be strictly based on and within the contents of the Tenderer's Technical Proposal submitted, without any disclosure, clarification or deliberation of the Price Proposal submitted. Organisation introduction and brief of the company profile should be kept to the minimum, which should not be more than five (5) minutes. The length of presentation shall not exceed three (3) hours.

1.4 The presentation shall be followed by a Question and Answer Section for the Government Representatives to make further enquiry about the Tenderer's Technical Proposal and presentation. Such Question and Answer Section should not be construed as any commitment by the Government. Any requests from the Tenderer for the Government to provide additional information about the tender requirements laid down in the Tender Documents or other vessel project plans of the Government will **not** be accepted.

2. Scope of Presentation

2.1 According to the requirements set out in Paragraphs 1.1 to 1.3 above, the presentation shall cover the following topics and follow the numbering sequence below.

(1) Organisation Introduction (not more than five minutes)

(2) Hull and Deckhouse

(3) General Arrangement

(4) Fire Safety Equipment

(5) Lifesaving Appliances and Arrangements

(6) Machinery

(7) Electrical System

(8) Operational Systems

(9) Waterjet System

(10) Innovation Suggestions

Part VII - Annex 13 – Not Used

Part VII – Annex 14 – Handling Assessment ("HA") at Pre-shipment Construction and Handling Inspection

1 General

1.1 The purpose of the HA is to:

(a) ensure that the offered Vessel's performance characteristics are compatible with the HKPF's operational role; and

(b) mitigate the risks to all parties associated with potential rejection of a constructed vessel at the Technical Acceptance and the Delivery Acceptance.

1.2 The Contractor shall arrange for a HA of the completed Vessel to be assessed by the Contractor, in the presence of MD's and HKPF's representatives, at or near the site where the Vessel is constructed. The HA shall be conducted and completed within two days. At least ten (10) working days in advance of the HA, the Contractor shall submit for MD's approval a HA programme proposal which includes details of the procedures under which the HA is to be conducted and the formats in which the Contractor proposes to capture and present the data recorded by the device(s) in accordance with Paragraph 1.4 of this Annex 14 and the digital video footage recorded in accordance with Paragraphs 1.5 and 1.6 of this Annex 14 during the HA. For the avoidance of doubt, this data and video footage shall be able to be copied, moved, deleted and played using Microsoft Windows' built-in software. Otherwise, the Contractor shall supply appropriate computer software that is compatible with Microsoft Windows for the reviewing of this data and the video footage at no extra cost to the Government. The HA shall be observed by the Government Representatives. At least one (1) of the HKPF's representatives shall be aboard the Vessel to be assessed to monitor and verify the conduct and results of each attempt at an assessment.

1.3 The Vessel to be assessed shall be completed and ready for delivery.

1.4 The Contractor shall ensure that an objective record (which can be reviewed by the Government Representatives or, if necessary, an independent third party such as RO/RA) of the date, time, position, speed, course, roll, pitch, yaw, trim, running angle and three-dimensional acceleration data generated during the HA. The HA shall be conducted in accordance with the assessment protocols stipulated in Paragraphs 2.1 of this Annex 14 and captured using a suitable device(s) which has/have been properly calibrated and, if required by the Government, with supporting calibration documents issued by the manufacturer or calibration laboratory.

1.5 The Contractor shall, throughout the HA, record date and time stamped aerial digital video footage of the Vessel to be assessed and, using digital video recording equipment affixed at appropriate locations as agreed by the HKPF on the Vessel to be assessed, record digital video footage of the:

(a) field of view from the control console forward over the bow to the horizon. For the avoidance of doubt, the camera shall be mounted on the longitudinal centre line at a height and distance from the bow which shall correspond with the eye position of a coxswain, 1.64 metres tall, seated at the helm;

(b) position of the helm and throttle controls at all times; and

(c) view facing astern with the field of vision centred on the longitudinal centre line of the Vessel to be assessed with the camera mounted as closed as possible at the transom.

1.6 The Contractor shall provide a suitable logistics boat from which the Contractor shall record digital video footage of the Vessel to be assessed undergoing the HA. This logistics boat shall be capable of a comparable speed and be piloted at a distance and position from the Vessel to be assessed.

1.7 The Contractor shall, immediately after the HA, provide to the Government Representatives the following:

(a) an electronic and printed record of the data recorded during the HA in a format(s) approved by MD in accordance with Paragraph 1.2 above by the device(s) stipulated at Paragraph 1.4 of this Annex which includes:

(i) the raw data captured in respect of each assessment protocol specified in Paragraphs 2.1 of this Annex;

(ii) a graphical depiction of each assessment showing the position and the track of the Vessel to be assessed throughout the assessment; and

(iii) on one chart the speed in knots and the roll and the pitch in degrees;

(b) the following copies of the digital video footage stipulated in Paragraphs 1.5 and 1.6 of this Annex stored on a digital storage medium in a format approved by MD in accordance with Paragraph 1.2 above, namely:

(i) aerial digital video footage;

(ii) fixed digital video footage captured from the Vessel;

(iii) digital video footage captured from the logistics boat; and

(c) a certificate, signed by both the Contractor and a Government Representative, which records accurately the actual Loading Condition of the Vessel as described in Paragraph 1.8.2(e) of this Part VII during each assessment of the HA.

1.8 The assessment protocols listed in Paragraphs 2.1 of this Annex shall be conducted in sea state of wave high with maximum wave high less than 0.3 metre, unless otherwise agreed with the Government Representative.

1.9 The Vessel to be assessed is required to complete and pass each of the assessments set out in Paragraphs 2.1 below. The Contractor shall have no more than five (5) attempts in total to complete and pass each of these assessments. If, at any time during an assessment, a Government Representative considers that it is unsafe to continue that assessment, the assessment shall be terminated immediately and that assessment shall be deemed to have been failed.

1.10 An identical mark should be affixed in a prominent location on the tested hovercraft. (HKPF)

2 Assessment Protocols

2.1 <u>Handling Assessment – Full Operational Load Condition</u>

The following assessment shall be conducted at Full Operational Load Condition as specified at Paragraph 1.7.2(e) of this Part VII.

2.1.1 <u>Straight Line Assessment</u>

(a) The coxswain shall accelerate from stationary to at least fifteen (15) knots within one (1) minute. At any time during this assessment, the bow of the Vessel should not rise above the horizon line with the automatic trim control system (if fitted) turned off. Should the bow rise above the horizon line with the automatic trim control system (if fitted) turned off, it shall not be for more than five (5) seconds as evidenced by the digital video footage. If the Vessel to be assessed does not achieve this, it shall be deemed to have failed the assessment.

(b) If the Vessel, maintaining the same course and settings, does not maintain a mean speed of at least fifteen (15) knots for a period of no less than one (1) minute, the Vessel shall be deemed to have failed this assessment.

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