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Bid Receiving Public Works and Government  
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Travaux publics et Services gouvernementaux  
Canada  
Pacific Region  
401 - 1230 Government Street  
Victoria, B.C.  
V8W 3X4  
Bid Fax: (250) 363-3344

## SOLICITATION AMENDMENT MODIFICATION DE L'INVITATION

The referenced document is hereby revised; unless otherwise indicated, all other terms and conditions of the Solicitation remain the same.

Ce document est par la présente révisé; sauf indication contraire, les modalités de l'invitation demeurent les mêmes.

Comments - Commentaires

Vendor/Firm Name and Address  
Raison sociale et adresse du  
fournisseur/de l'entrepreneur

Issuing Office - Bureau de distribution  
Public Works and Government Services Canada -  
Pacific Region  
401 - 1230 Government Street  
Victoria, B. C.  
V8W 3X4

<b>Title - Sujet</b> Fab & Del Two 8.3 - 8.6 M RIBs	
<b>Solicitation No. - N° de l'invitation</b> F7047-150008/A	<b>Amendment No. - N° modif.</b> 002
<b>Client Reference No. - N° de référence du client</b> F7047-150008	<b>Date</b> 2015-10-08
<b>GETS Reference No. - N° de référence de SEAG</b> PW-\$XLV-166-6806	
<b>File No. - N° de dossier</b> XLV-5-38087 (166)	<b>CCC No./N° CCC - FMS No./N° VME</b>
<b>Solicitation Closes - L'invitation prend fin at - à 02:00 PM on - le 2015-10-26</b>	<b>Time Zone</b> Fuseau horaire Pacific Daylight Saving Time PDT
<b>F.O.B. - F.A.B.</b> <b>Plant-Usine:</b> <input type="checkbox"/> <b>Destination:</b> <input checked="" type="checkbox"/> <b>Other-Autre:</b> <input type="checkbox"/>	
<b>Address Enquiries to: - Adresser toutes questions à:</b> Castle, David G.	<b>Buyer Id - Id de l'acheteur</b> xlv166
<b>Telephone No. - N° de téléphone</b> (250) 363-0110 ( )	<b>FAX No. - N° de FAX</b> ( ) -
<b>Destination - of Goods, Services, and Construction:</b> <b>Destination - des biens, services et construction:</b>	

Instructions: See Herein

Instructions: Voir aux présentes

<b>Delivery Required - Livraison exigée</b>	<b>Delivery Offered - Livraison proposée</b>
<b>Vendor/Firm Name and Address</b> <b>Raison sociale et adresse du fournisseur/de l'entrepreneur</b>	
<b>Telephone No. - N° de téléphone</b> <b>Facsimile No. - N° de télécopieur</b>	
<b>Name and title of person authorized to sign on behalf of Vendor/Firm (type or print)</b> <b>Nom et titre de la personne autorisée à signer au nom du fournisseur/de l'entrepreneur (taper ou écrire en caractères d'imprimerie)</b>	
<b>Signature</b>	<b>Date</b>

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**SOLLICITATION AMENDEMENT N2 NECESSAIRE POUR INCORPER les amendements suivants a la sollicitation.**

**Dans la clause 6.6 de la Partie 6, Clauses du contrat, inserer les details de la livraison suivante;**

**6.6.2 Paiements d'étape**

Le Canada effectuera les paiements d'étape conformément au calendrier des étapes détaillé dans le contrat et les dispositions de paiement du contrat si :

- a) une demande de paiement exacte et complète en utilisant le formulaire PWGSC-TPSGC 1111, Demande de paiement progressif, et tout autre document exigé par le contrat ont été présentés conformément aux instructions relatives à la facturation fournies dans le contrat;
- b) toutes les attestations demandées sur le formulaire PWGSC-TPSGC 1111 ont été signées par les représentants autorisés;
- c) tous les travaux associés à l'étape et, selon le cas, tout bien livrable exigé ont été complétés et acceptés par le Canada.

### 6.6.3 Calendrier d'étape

CE No:	Bateau	Étape définition	Note	Dates Étape	Valeur d'étape
1W	Bateau 1	Coque soudée, y compris la cabine le cas échéant, des cadres, des raidisseurs, excluant l'installation du pont. Peinture avant armement	35%		\$____X____
2W	Bateau 1	Armement, Equipements Electronique, moteur (s), le (s) réservoir (s) de carburant (s), ancillaries système (tuyauterie, câblage) incluant pont	35%		\$____X____
3W	Bateau 1	Remorque	30%		\$____X____
5W	Bateau 2	Coque soudée, y compris la cabine le cas échéant, des cadres, des raidisseurs, excluant l'installation du pont.	35%		\$____X____
6W	Bateau 2	Armement, Equipements Electronique, moteur (s), le (s) réservoir (s) de carburant (s), ancillaries système (tuyauterie, câblage) incluant pont,peinture	35%		\$____X____
7W	Bateau 2	Remorque	30%		\$____X____

## Annexe B - QUESTIONS DES SOUMISSIONNAIRES ET DES RÉPONSES DU CANADA

Invitation # F7047-150008

**Exigence : demande de propositions (DP) : la fabrication et la livraison de deux (2) 8,3 m à 8,6 des embarcations pneumatiques à coque rigide avec consoles ouvertes, T-tops et remorques pour le ministère des Pêches et des Océans.**

Élément	Spec-DP Description	Question	Réponse
9.9.1	Système de redressement automatique de conception éprouvée doit être installé par certifié Technicien en système de redressement automatique.	Pouvez-vous nous dire qui le conseil d'administration est que fournit une certification ou de ce qui est attendu?	9.9.1 devrait lire; "système de redressement automatique de conception éprouvée doivent être installés par l'entrepreneur et certifié en condition de charge normal par le calcul par un architecte naval de l'entrepreneur's choice".

Élément	Spec-DP Description	Question	Réponse
6.4.1	La soudure doit satisfaire à la spécification de soudage de la Garde côtière canadienne, CT-043-EQ-EG-001-E Mars 2014 edition	Veuillez fournir une copie de la spécification.	Copie fournie par courrier électronique.

Élément	Spec-DP Description	Question	Réponse
6.6.7	Méthode de paiement - Paiement unique	Nous aimerions savoir si le client est ouverte au progrès paiements plutôt qu'un seul paiement.	Le client fournira deux (2) Paiements d'étape; l'une pour la construction de la coque terminée et vérifié par l'autorité d'inspection à 35% et la deuxième pour la livraison à destination, à 65 %.

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Élément	Spec-DP Description	Question	Réponse
3.6.3	L'aluminium	Le Canada acceptera 5083 H116 à la place de 5086 H32 Plaque d'aluminium?	Oui
Élément	Spec-DP Description	Question	Réponse
5.0	Caractéristiques physiques	Sont les dimensions identifiées dans la DTB fondée sur vaisseau réel des restrictions ou sont-ils fournis à titre indicatif seulement? Le Canada pourrait-il favoriser un navire qui dépasse la longueur et/ou exigence de faisceau identifié, si toutes les autres exigences peuvent être satisfaites?	Les dimensions et tous les autres besoins identifiés dans la DTB doivent être remplis.
Élément	Spec-DP Description	Question	Réponse
8.6	La forme de sa coque	Sont les caractéristiques identifiées dans la DTB fondée sur vaisseau réel des restrictions ou sont-ils fournis à titre indicatif seulement? Le Canada pourrait-il accepter un monocoque de coque " V " forme avec similaires mais pas exact morts ressusciteront, chinoises et virures comme décrit, si toutes les autres exigences peuvent être satisfaites?	Tous les besoins identifiés dans la DTB doivent être remplis.

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Élément	Spec-DP Description	Question	Réponse
8.8.7	Oreilles de levage	Le Canada acceptera un dispositif de levage à 3 points à la place d'un dispositif de levage à quatre points?	Tous les besoins identifiés dans la DTB doivent être remplis.
Élément	Spec-DP Description	Question	Réponse
8.13	Le collier	Le Canada acceptera le collier matériau fabriqué à partir de nylon enduit de polyuréthane avec coutures soudées par la chaleur au lieu de l'Hypalon de nylon enduit avec coutures collées?	La pêche a utilisé et continuera à utiliser les colliers d'aile, cependant relativement à cet appel d'offres, tous les besoins identifiés dans la DTB doivent être remplis.
Élément	Spec-DP Description	Question	Réponse
10.4.2	Réservoir de carburant	Le Canada acceptera un seul réservoir à carburant pour répondre aux besoins en capacité de carburant 1000L? L'aluminium	Tous les besoins identifiés dans la DTB doivent être remplis.
Élément	Spec-DP Description	Question	Réponse
10.4.8	Remplissage de carburant	Le Canada acceptera un emplacement de remplissage carburant autre que l'avant de la proue casier?	Tous les besoins identifiés dans la DTB doivent être remplis.

**Table H-1 Mandatory Requirement**

COLUMN A	COLUMN B	COLUMN C	
Description	Bidder Proposal	Mandatory Requirement	
		Bid Ref Page	Pass / Fail
1.0 OVERVIEW			
1.1 Rigid Inflatable Boats (RIBs) are used extensively as primary craft for Fisheries and Oceans Canada's fleet of vessels, as well as operating independently to carry out various program-related activities from shore-based facilities and trailers.			
1.2 The primary mission is fisheries management through catch monitoring and enforcement, including environmental response, search and rescue, emergency boat duties.			
1.3 The vessel must be configured as a T-Top and Shock seating equipped open RIB with an open fore deck accessible by steps around the side of the console. The vessel will be used to conduct conservation branch operations. The vessel must have an all-weather capability to Beaufort force 8. It is desirable that this vessel has a high-speed capability of at least 40-45 knots.			
1.3.1 Perform searches and surveillance by visual and electronic means;			
1.3.2 Tow equipment and other vessels in emergencies; and			
1.3.3 The craft must be capable of being ship-borne or shore-based: launched and recovered by stern ramp, davits or other means of hoisting such as derricks/cranes utilizing bridle. These craft will be primarily shore-based and will be launched and recovered by a trailer or deployed from a shore facility dock, and occasionally lifted aboard support ships.			
2.0 REQUIREMENT			
2.1 General Information: This vessel is intended to be built based on stock small working or commercial vessel hull			



forms with a minimum of customization as indicated herein. Prototype hulls will not be considered for this procurement. A minimum of two proven hulls must be shown to have been produced and be in service within the last 5 years for the Contractor to indicate suitability of the hull for this procurement. Bidders must submit at a minimum the following items for each proven hull: General arrangement drawings; Photographs; References; Builder's plates; and, Hull identification numbers confirming the multiple builds.			
<b>2.2</b> The Contractor must design, fabricate and supply quantity, two (2) 8.3-8.6m Open Aluminum T-Top Rigid Inflatable Boats (with an option for one additional vessel). The Vessels must comply with Transport Canada Marine Safety Branch (TCMSB) Marine Safety Publications TP 14612 and TP 1332. The boat must be an Aluminum Hull twin outboard motor configuration.			
<b>2.3 Technical and Documentation Requirements</b>			
The Contractor is responsible for all aspects of design and production of the vessel and must prepare their own Project Data Package to define the vessel and control the production process.			
<b>2.3.1 Bid Deliverable Data Package</b> Requirements for Bid Deliverables are given in the Solicitation Document and applicable Annexes.			
<b>2.3.2 Preliminary Data Package</b> The Preliminary Data Package must demonstrate that the vessel will be fully seaworthy, operable and fit in all regards for the purposes intended. The Contractor must submit their Preliminary Data Package for review by the Technical Authority and in accordance with the Contract.			
In addition to any requirements given in the Contract and applicable Annexes, the Preliminary Data Package must include, but will not necessarily be limited to, the following technical drawings and information:			
<b>2.3.2.1</b> As identified in TP 14612, have received a certificate of approval following the procedures contained herein.			
<b>2.3.2.2</b> A general arrangement.			

<b>2.3.2.3</b> Structural Drawings showing Deck Plan, a Centerline profile.			
<b>2.3.2.4</b> A detailed Lines Plan.			
<b>2.3.2.5</b> A drawing of the fuel supply arrangement.			
<b>2.3.2.6</b> A drawing of bilge pumping system.			
<b>2.3.2.7</b> Electrical one-line diagram.			
<b>2.3.2.8</b> The lightship weight.			
<b>2.3.2.9</b> Draft Stability Calculation of the proposed vessel.			
<b>2.3.2.10</b> A Project Plan (written description) of how the Bidder/ Contractor will comply with the TSOR. The written description must address each main element of the TSOR and indicate how the Bidder/Contractor will comply with the intent of the TSOR and successfully deliver the vessel(s) to the performance standard(s) identified.			
<b>2.3.2.11</b> A Preliminary Production Schedule which must verify the Bidder/Contractor's ability to deliver the vessel(s) in accordance with the requirements of the Solicitation.			
<b>2.3.3 Construction Data Package</b>			
The Contractor must revise and update their Preliminary Data Package to incorporate comments from the Technical Authority and must complete and submit their Construction Data Package to the Technical Authority. The Contractor must update their Construction Data Package to reflect changes in the requirement and/or changes in materials or equipment as necessary or when requested.			
In addition to any requirements given in the Contract and applicable Annexes, the Construction Data Package must include, but will not necessarily be limited to, the following technical drawings and information:			
<b>2.3.3.1</b> All technical drawings and information identified within the "Preliminary Data Package", updated as necessary (excepting that the "Project Plan" need not be revised);			
<b>2.3.3.2</b> The "Preliminary Production Schedule" must be expanded to a "Production Schedule" which must be regularly updated to demonstrate progress of the work and anticipated completion date;			
<b>2.3.3.3</b> Lightship weight and center of			

gravity calculations must be monitored and the Technical Authority must be advised of changes as they are identified;			
<b>2.3.3.4</b> Stability calculations must be revised when necessary or when requested;			
<b>2.3.3.5</b> Speed and endurance calculations;			
<b>2.3.3.6</b> Additional technical drawings, schedules and information as necessary to fully define the vessel;			
<b>2.3.3.7</b> Contractor shop drawings;			
<b>2.3.3.8</b> Technical information pertaining to materials and equipment;			
<b>2.3.3.9</b> Material certificates; and,			
<b>2.3.3.10</b> Other applicable technical information.			
<b>2.3.4 Final Data Package</b> The Contractor must provide to Canada all documentation required by the Contract, this TSOR and other annexes or attachments to the Contract.  <b>The minimum acceptable final data package is as attached hereto at Appendix I.</b>			
<b>3.0 DESIGN AND CONSTRUCTION REQUIREMENTS</b>			
Unless stated otherwise all components, equipment and material must be contractor supplied.			
<b>3.1 Ergonomic Design</b>			
<b>3.1.1</b> Hazardous operating conditions must be prevented by arranging machinery and equipment in a safe manner; providing guards for all electrical, mechanical and thermal hazards to personnel; and providing guards or covers for any controls that might accidentally be activated by contact of personnel.			
<b>3.1.2</b> The boat must be designed and constructed to accommodate both male and female crew from approx. 5' 5" to 6' 4" in height, wearing cold weather clothing and equipment in accordance with ASTM F1166-07 Standard Practice for Human Engineering Design for Marine Systems, Equipment, and Facilities.			
<b>3.1.3</b> Human engineering factors considered in design must include accessibility, visibility, readability, crew efficiency and comfort. All equipment			

must be accessible for use, inspection, cleaning and maintenance as per ASTM F1166-07.			
<b>3.2 Vibration</b>			
<b>3.2.1</b> The boat and all components must be free of local vibration that could endanger boat personnel, damage boat structure, machinery or systems, or interfere with the operation or maintenance of boat machinery or systems.			
<b>3.2.2</b> Mounts for movable components, including items moved for stowage, towing or transport must be provided with resilient material as necessary to prevent rattling.			
<b>3.2.3</b> Loosening of fasteners under vibration must be prevented by the use of self-locking fasteners.			
<b>3.3 Equipment Protection</b> The Contractor is responsible for the care of all equipment. All parts, especially those having working surfaces or passages intended for lubricating oil, must be kept clean and protected during manufacture, storage, assembly and after installation. Equipment must at all times be protected against dust, moisture or foreign matter and must not be subject to rapid temperature changes or extremes in temperature.			
<b>3.4 Site Cleanliness</b> During construction, all chips, shavings, refuse, dirt and water must be removed at the completion of the work shift or sooner. The Contractor must ensure measures are taken to avoid wear and damage incident to construction, and to prevent corrosion or other deterioration. Equipment subject to freezing must be kept drained, except during test and trials. Equipment must be kept clean and protected from the environment prior to installation.			
<b>3.5 Materials</b>			
<b>3.5.1</b> All materials must be corrosion resistant and suitable for use in a salt water environment as detailed in the Operational Requirements. All materials normally subjected to sunlight must resist degradation caused by ultraviolet radiation. Galvanized materials are unacceptable.			
<b>3.5.2</b> Dissimilar Metals: Direct contact			

of electrolytically dissimilar metals is not allowed. Electrolytic corrosion must be prevented by insulating dissimilar materials from each other with gaskets, washers, sleeves, or bushings of suitable insulating material.			
<b>3.5.3 Aluminium:</b> Aluminium alloy types 5086-H32 must be used for plate; aluminium alloy 6061-T6 (anodized grade), suitable for type 5356 filler alloy, must be used for extruded shapes and 6063 for welded tubing and pipe. Non-structural items of trim and outfit such as hatch frames, castings, consoles, and hardware items may be of other aluminium alloys suitable for commercial saltwater marine use such as dual rated 5083 / 86 or 5052 or 6063-T54.			
<b>3.5.4 Stainless Steel:</b> Stainless steel type 316L or 316 must be used for all stainless steel applications except as noted. Alloy 316L must be used in any welded underwater components.			
<b>3.5.5 Fittings and clamps</b> must be stainless steel. Bolts used in all fittings must be Type 316 stainless steel.			
<b>3.5.6</b> Where flexible connections are required for steering and fuel systems, suitable hose with permanently crimped, detachable reusable type fittings must be used.			
<b>3.5.7</b> All materials and equipment must be stored installed and tested in accordance with the manufacturer's guidelines, recommendations and requirements.			
<b>3.6 Fasteners</b>			
<b>3.6.1</b> All fasteners must be of corrosion resistant materials.			
<b>3.6.2</b> Cadmium plated parts and fasteners, including washers, must not be used.			
<b>3.6.3</b> Direct attachment of alloys containing copper to aluminium is not permitted except for an electrical bonding strap.			
<b>3.6.4</b> No fasteners must be directly threaded into Aluminum. Aluminium or Stainless steel washers or backing plates must be used as appropriate.			
<b>3.6.5</b> Where nuts will become inaccessible after assembly of the vessel, nuts must be captured or anchored to allow reassembly and prevent backing off. Unless otherwise			

specified, self-locking nuts must be installed to prevent loosening of fasteners due to shock and vibration.			
<b>3.6.6</b> Fasteners in deck traffic areas must be flush-mounted to eliminate tripping and snagging hazards.			
<b>3.7 Facilities (GRP lamination, collar and painting facilities)</b>			
The Contractor must have a shop capable of maintaining temperature and humidity appropriate for temperature and moisture sensitive materials, painting and as applicable. It must be capable, when necessary, of maintaining temperature between 16°C and 25°C and maintaining relative humidity below 70%.			
<b>4.0 OPERATIONAL REQUIREMENTS</b>			
<b>4.1 General - ISO Category B design.</b> Unless otherwise stated, performance must be for conditions of zero sea state and no wind, in salt water in normal load condition. The boats must be designed and constructed for ease of maintenance and repair, long life, and are to be easily supportable in the location of the delivery address of the boat, by local commercial facilities and suppliers. The boat must be expected to have a service life of at least 10 years, with an expected usage of between 300 and 500 hours per year. Life cycling cost projections must be supplied by manufacturer with their proposal, particularly for hull, collar, propulsion, steering and other components and systems.			
<b>4.1.1</b> Maximum speed: 40 knots - 45 knots.			
<b>4.1.2</b> Minimum speed: 20 knots in sea state 6 with 30-knot wind.			
<b>4.1.3</b> Endurance: 35 knots for 4.5 hours.			
<b>4.1.4</b> Range: 200 nautical miles with 10% reserve at 25-knot minimum speed			
<b>4.1.5</b> Steering: Capable of steering 15 degrees from heading, Beaufort force 7, with seas from any direction.			
<b>4.1.6</b> Steer and manoeuvre effectively at 3 knots in Beaufort force 7.			
<b>4.1.7</b> Maintain course, made good over ground, when proceeding at 3 knots with relative crosswind of 35 knots.			
<b>4.1.8</b> Capable of turning in its own length in Beaufort force 7.			
<b>4.1.9</b> Capable of steering effectively in			

Beaufort force 7 with winds of 30 knots while holding a 15 tonne (displacement) vessel in position.			
<b>4.2 Beaching</b>			
<b>4.2.1</b> Capable of beaching on soft (sand, earth or clay) surfaces at a speed of up to 5 knots without damage to the hull.			
<b>4.2.2</b> Capable of beaching on hard (stone or concrete) surfaces at speeds of up to 3 knots without damage to the hull.			
<b>4.3 Environmental Conditions</b>			
Capable of operating day or night in the following conditions:			
<b>4.3.1</b> Average ambient air temperature range: -10C to +30 C.			
<b>4.3.2</b> Average water temperature: 0 C to +25 C			
<b>4.3.3</b> Wave heights of 7.5 meters (Beaufort force 8)			
<b>4.3.4</b> Wind speeds of 34-40 knots minimum.			
<b>4.3.5</b> Operates in freezing spray or freezing rain with accumulations of up to 6.0 mm while maintaining stability while allowing for safe transit in Beaufort force 7.			
<b>4.3.6</b> Required to operate safely in ice infested waters, (some minor damage to the boat, not affecting stability or buoyancy is acceptable).			
<b>4.4 Launching, Recovery &amp; Transportation</b>			
The craft must be readily road transportable on a trailer, must be able to be launched and recovered using the trailer at existing launch ramps.			
<b>4.5 Maintenance</b>			
The craft must be designed and constructed for ease of maintenance and repair, long life, and be easily supportable by local commercial facilities and suppliers.			
<b>5.0 PHYSICAL CHARACTERISTICS</b>			
<b>5.1 Vessel Particulars</b>			
<b>5.1.1</b> Length overall between 8.3 and 8.6 meters.			
<b>5.1.2</b> Breadth overall between 3.0 to 3.2 meters.			
<b>5.1.3</b> Maximum draft (outboard motors lowered) between 0.70 and 0.90 meters.			
<b>5.1.4</b> Maximum draft (outboard motors raised) between 0.50 and 0.70 meters.			
<b>5.1.5</b> Maximum freeboard (from top of			

collar AFT, in normal load condition) 0.70 meters.			
<b>5.1.6</b> Open Style; full beam deck between tube cradles.			
<b>5.1.7</b> Open RIB that is not higher than 13.5 feet tall that has a radar arch that may fold to that height if necessary. Dual position shock seating at T-top console. Dual auxiliary fold up jump seats to be fitted behind the console seating.			
<b>5.1.8</b> Depth Under Keel:			
<b>5.1.8.1</b> Operate carefully in depths of 1.0 meter with outboard motors lowered.			
<b>5.1.8.2</b> Basic manoeuvring in depths of 0.90 meters with outboard motors in the partially raised position.			
<b>5.1.9</b> Maximum height of collar above deck 0.60 meters			
<b>5.1.10</b> Displacement (Normal Load Condition) between 3100 kg and 3300 kg.			
<b>5.1.11</b> Normal Load Conditions:			
<b>5.1.11.1</b> Crew of 4 = 450kg (max capacity min 10 persons).			
<b>5.1.11.2</b> Fuel = Minimum 1000 liters in two tanks, (Total 719kg).			
<b>5.1.11.3</b> Equipment & supplies = 700kg.			
<b>5.1.11.4</b> Payload capacity to be min 1000kg in addition to full fuel.			
<b>6.0 CONSTRUCTION STANDARDS</b>			
<b>6.1</b> Boats constructed under this TSOR must comply with the following:			
<b>6.1.1</b> The current TCMS TP 1332 "Construction Standards for Small Vessels" and where applicable the American Boat & Yacht Council (ABYC), and			
<b>6.1.2</b> CSA C22.2 No. 183.2-M1983 (R1999) Standards for DC Electrical Installations on Boats and ABYC 'E' Electrical Standards.			
<b>6.2 Transport Canada Marine Safety Regulation TP 1324 Coated Fabrics</b>			
Transport Canada Marine Safety Regulation TP 1324 Coated Fabrics as a minimum, however, if the IMO requirements exceed those of TP1324, the more stringent of the two must take precedence.			
<b>6.3 CSA W47.2-M1987</b>			
Certification of Companies for Fusion Welding of Aluminium; Welding to be done by contractor with shop certified to this standard.			



<b>6.4 CT-043-EQ-EG-001-E</b>			
Welding of the hull and components must meet the requirements as identified in the Canadian Coast Guard Welding Specification, March 2014 edition. Supplied as a separate attachment to the TSOR.			
<b>6.5 Stability Calculations</b>			
Stability examination per TP1332 (from ISO standards 12217 and ISO 6185 RIB's over 6m) will require the Contractor to record all stability calculations and trial results and provide a copy for each boat produced, to be placed in the technical manuals.			
<b>7.0 VESSEL CONFIGURATION</b>			
<b>7.1 Open T-Top Vessel Configuration</b>			
<b>7.1.1 General Deck Arrangement:</b>			
<b>7.1.1.1</b> There will be at least 3 tie up points from bow to transom. One cruciform tow post forward, 2 cleats aft that are mounted to the transom corners or the self-righting frame.			
<b>7.1.1.2</b> Vessel will be outfitted with a lighting, and self-righting supporting arch, per section 9.9, including a supporting a lash back screen and tow reel with 100m of 3/4" tow line. Contractor to identify location of tow post in relation to tow reel.			
<b>7.1.1.3</b> A dual position console, with four seating positions, two being located aft of the helm seating, must be integrated with a T-Top with windshield, and support radar and lighting, see below.			
<b>7.1.1.4</b> There will be a tow post fitted in the vicinity of the transom used for EMERGENCY towing, rated for 3000 lb. (1360 kg.), ahead of the thrust point of the craft taking into consideration the placement of the tow reel.			
<b>7.1.1.5</b> There will be two removable bow rails one on either side of the forward tow post used for boarding vessel. The bow rails when removed will not be a snagging (nets) or tripping hazard			
<b>7.1.1.6</b> Vessel must be fitted with aluminium protective pipe bracket, which extends around the outside of the outboard motors. This guard must be fabricated so as to be easily removed to facilitate the removal of the outboard engines.			
<b>7.1.1.7</b> There shall be three storage			

lockers forward of the T-Top. All storage lockers must have a drain of a large enough diameter that does not easily plug built into the hatch cover. All hatch covers and doors will allow for the door to open while a gloved hand is gripping the hand hold and that the hand hold can be locked with a pad lock.			
<b>7.1.1.8</b> First the bow locker that also secures the fuel filler must allow water to drain through to the bilge of the vessel but must be screened so that it does not allow gear or equipment to leave the compartment. The bow locker must be a minimum of 17" from front to back, 27" wide at the forward portion of the locker and 37" at the aft portion of the locker and as deep as possible that the hull will allow.			
<b>7.1.1.9</b> The second locker should be a freeman style hatch that creates the maximum storage space possible but must be screened so that it does not allow gear or equipment to leave the compartment. The hatch will be 18 inches wide and 11 ¾ from front to back.			
<b>7.1.1.10</b> The third locker must be watertight to store dry goods equipped with a drain inside and be constructed in a way that allows water from the bow to pass underneath but not through the storage locker. The locker must have a drain in case water does enter the locker. The hatch for the locker should be a minimum of 41" from front to back and 21" wide. The locker must be a minimum of 56" from front to back and 40" wide with a minimum depth of 17".			
<b>7.1.1.11</b> There must be two self-draining (one sump and pump for both boxes) seizure lockers, one each P&S in the cockpit deck outboard aft. Size to be a minimum of 42 inches long, 11 inches deep and a minimum of 22 inches wide at the widest portion. With a hatch door that is able to hold itself open by a gas shock or equivalent option.			
<b>7.1.1.12</b> Vessel must be equipped with securing eyes fitted to the outside of the transom used for trailer tie downs, and bow eye for towing and trailer tie down.			
<b>7.1.1.13</b> Deck Davit: The Contractor must supply and install Safe-T Puller Light Commercial Model (Part #STP-2100) pot puller with 2.1 HP 12 volt electric power head, stainless steel self-			

grip sheave, air bellows foot switch and solenoid, 8 gauge wiring harness, 80 AMP circuit breaker, 2"schedule 80 aluminium davit, UHMW plastic sleeved side deck /cabin bulkhead bracket, and kick-plate bracket with stainless steel quick release pin. Secured to the t top when not in use and can lock in place with the pin. The davit arm and upper swivel portion must be removable and stowed in the largest below deck hold. The davit needs to be rated for a minimum of 500lbs.			
<b>7.2 Seated or Standing Console, with Windscreen and T-Top</b>			
<b>7.2.1</b> T-Top console to be constructed to low weight, high strength specifications from aluminium to withstand the accelerations of the vessel while in extreme service conditions. Successful construction methods presented include main console construction of 3/16" plate, braked at the corners, with tiered and/or sloped top surfaces for installation of controls and electronics. Alternate construction method using 2" schedule 40 pipe framing with plate panels filling the console and window faces is also commonly used. Weight and structural integrity are paramount concerns. The T-Top aft width from tube cradle to T-Top must allow sufficient space for water to rapidly drain aft from the forward cockpit.			
<b>7.2.2</b> The T-Top shall be at least 54" wide at the forward side, 62" wide at the aft portion of the console, the height from floor to top of the roof must be at least 81" high, and the length of the roof must be at least 84" long.			
<b>7.2.3</b> An overhead hinged console must be fitted with space adequate for two VHF radios, which must not protrude into the headroom of operators standing ahead of seating.			
<b>7.2.4</b> The operator console must have weather tight aft face access hatch below the console dash. There must be a weather tight hatch or door in the forward face of the main console to access the space below the console for electrical equipment and console electronics access. The inside of the door will have a storage bin mounted to the door with recessed fasteners.			
<b>7.2.5</b> Handholds of minimum 3/4" schedule 40 pipe must be positioned on			

the aft, top edge of the upper console and across the forward face above the electronics access door. In addition, pipe rails must run up the outboard edges of the forward window frame, tilted away from centre so as to provide minimal visual obstruction to forward operators.			
<b>7.2.6</b> There must be a forward window and side windows on the console. The space on the console top must be long enough fore and aft so that there is a writing area at the navigation position, that is weather protected, the area must be large enough to have a writing surface for note taking and document writing and a hatch for a storage compartment that is a minimum of 17" wide and 15" from front to back and 10" deep. The compartment must be made to have a portion for legal hanging folders and the rest of the room for glove box style storage. Forward window to be equipped with bottom mounted, wide sweep, pantograph wiper system. The aft sweeping forward corner frames must also be equipped with air dams to control air and water "wrap" of the window corners. Dams to continue aft and direct water to the aft corners of the T-top. Side and aft pipe handrails must be provided on the T-top roof frame to provide handholds when standing on tubes or aft deck. These handrails to integrate with the forward window frame corner rails.			
<b>7.2.7</b> The T-Top must be supported at forward corners of the console top, and have sufficient strength to support the T-Top without additional support posts aft of the helm, with overhang aft sufficient to extend past the aft 'jump seat' positions.			
<b>7.2.8</b> The console must be fitted with a "Sunbrella" cover, twist lock attachment to the overhead and hanging down immediately aft of the side windows and aft console corners, securing to the console. The purpose of the cover is to protect the console electronics from moisture and spray when the boat is travelling or unattended. The T-Top console to be constructed to low weight, high strength specifications from aluminium to withstand the accelerations of the vessel while in extreme service			

conditions. Successful construction methods presented include main console construction of 3/16" plate, braked at the corners, with tiered and/or sloped top surfaces for installation of controls and electronics. Alternate construction method using 2" schedule 40 pipe framing with plate panels filling the console and window faces is also commonly used. Weight and structural integrity are paramount concerns.			
<b>7.2.9</b> A seat cover must be constructed that will cover all four seats and keep them dry when the vessel is left in the elements.			
<b>7.2.10</b> T-Top sides must be flared out from front to back with aft corners coming next to tube cradle inner fastening channel allowing sufficient space for water to drain aft from forward cockpit area.			
<b>7.2.11</b> There must be a step fore and aft mounted to the T-Top on both sides to step up onto the tube set.			
<b>7.2.12</b> Hand Holds – (to be a minimum of 3/4" schedule 40 pipe).			
<b>7.2.13</b> There will be a hand hold rail extending from above the side window, around the roof edge to the other side.			
<b>7.2.14</b> There will be a vertical hand hold, each side, extending aft from the roof base down to the base of the side window.			
<b>7.2.15</b> There will be a hand hold across the aft edge of the horizontal plane of the navigator position. The fastening base of this hand hold will extend from side to side under the hand hold.			
<b>7.2.16</b> There will be a hand hold on each side, below the side window, extending from front to back on side of T-top.			
<b>7.2.17</b> There is to be a vertical hand hold extending the full height of the windshield, tilted away from the center so as to provide minimal visual obstruction to forward operators.			
<b>7.2.18</b> There will be a hand hold extending across the full width of the front of the T-Top, positioned above the forward door allowing sufficient space for the door to open while a gloved hand is gripping the hand hold.			
<b>7.2.19</b> A large lockable 'glove box' locker to be fitted in the T top console.			

<b>7.3 Horizontal top Surface of Console</b>			
<b>7.3.1</b> The surface shall be sufficient in size to allow for a laptop computer station to be installed in front of the helm position.			
<b>7.3.2</b> The surface area in front of the navigator position shall be sufficient in size for the following:			
<b>7.3.2.1</b> A writing area sufficient in size for a note book binder;			
<b>7.3.2.2</b> A lockable glove box. This will extend down below the writing surface and be divided in two. One area will be designed to support hanging legal file folders and the other area large enough for storage of different items, i.e. note books etc; and			
<b>7.3.2.3</b> Above the console will be a communications area housing the different electronics. The electronics are to be accessible by the helm and navigator.			
<b>7.3.3</b> There will be overhead red LED (4) and white LED (4) lights positioned over the console. There is to be red LED (4) and white LED (4) lights over the two aft seat positions. The red lights are to be dimmable.			
<b>7.3.4</b> There is to be 2 LED lights installed inside the T-top storage compartment			
<b>7.3.5</b> There is to be space for a David Clark control head and also head set hangers installed on underside of the T-Top roof. The hangers must be located above each seat centred so that they can be easily hung up and must not fall off if the vessel is being operated in rough weather.  The top roof portion is to have a continuous water dam which will extend from the front along the side and across the back continuing along the other side to the front. This dam is to be attached in a manner that will not allow water to leak underneath.			
<b>7.3.6</b> There is to be two drains, one each corner of the aft roof just forward of the water dam. These water drains will take water down from the roof and discharge it on the deck at the bottom of the T-top (integrated into hand holds).			
<b>7.3.7</b> Foot rail. The standard will be that there is an aft face door, the foot rail will need to be configured to meet the above			

requirements of use, and, allow for the door to open to a minimum of 90 degrees. If there is no door there can be one continuous foot rail from side to side on the aft face of the T-top.			
<b>7.3.8</b> The throttle wedge must have removable covered padding that matches the covering on the seats attached that will cushion the impact of the crew min 1 inch thick.			
<b>7.4 Access Doors into T-Top</b>			
<b>7.4.1</b> There is to be a large, lockable (w/padlock), access door into the forward face of the T-top. This door is to be weather tight and the locking latch handle is to be of sufficient size to be operated with a gloved hand. The door is to have a pneumatic shock to have the door held steady in the open position. The inside of the door will have a storage bin mounted to the door with recessed fasteners. This door will be hinged on the port side and open towards the port side towards the gear hauler post. The door may have a catch mounted to the davit post and the door to keep it open.			
<b>7.4.2</b> There will be a smaller lockable access door in the aft face of the T-top below the console. This door is to be weather tight and the locking latch handle is to be of sufficient size to be operated with a gloved hand.			
<b>7.4.3</b> The windshield for the T-top is to have a Category B rating and will be in the appropriate metal frame.			
<b>7.4.4</b> Windshield washer tank and sprayer on front windshield.			
<b>7.4.5</b> Side windows will be in metal frames.			
<b>7.4.6</b> There is to be a bottom mounted windshield wiper of the pantograph style. This control for this wiper will also have a deal function.			
<b>7.4.7</b> The T-Top is to be fitted with a "Sunbrella" type material which will be fastened from each side around the back. This will extend from the roof of the T-top to the deck. It is to be fastened with twist locks and grommets that do not come in contact with dissimilar metals. The upper part of the Sunbrella enclosure will have clear plastic panels allowing the helm side and aft visibility. Each side is to have a			

large zipper door, that when unzipped can be rolled up and securely fastened in the up position. The same will apply to the aft section of the enclosure allowing it to be unzipped and rolled up and fastened.			
<b>7.5 Seating and Stand-Up Operation</b>			
<b>7.5.1</b> Two shock mitigating seats are required with two additional rear, forward folding jump seats behind the operator positions. Aft seats to be jockey style with pommel pipe handhold and secure footrests, the rear seats must be two Shockwave S2 Jump seats with arm rests and seat belts. When the seats are in the folded upright position it should still provide a hand hold for a person should they choose to stand.			
<b>7.5.2</b> Forward seating to be 'Shockwave' G-Force type seats with height and slider adjustment, on stands, with fold up seat edge to act as support for operators when folded up and driving in a standing position. Seats to have spring loaded footrests, folding arms, and seatbelts. The seat base must be wide enough to have the forward seats positioned in line with the foot rest in both the helm and starboard seating position inside the T-Top.			
<b>7.5.3</b> The seat mounting area to be suitably reinforced and framed to support the full G-load capability of the shock mitigation seating.			
<b>7.5.4</b> The seating bases, if any, are to be equipped with lockable stowage if adequate space is available. Seat base slider must be used to facilitate equal facility to use console equipment in seated or standing position			
<b>7.5.5</b> Seats must be designed to support a person of 150 kg			
<b>7.6 Console Lighting</b>			
<b>7.6.1</b> There must be a red chart lamp on the communications side of the console, for the navigator with switch, and dimmer.			
<b>7.7 Foot Rests</b>			
<b>7.7.1</b> There must be pipe foot rest(s), servicing forward positions at the console, for use when standing while operating. Foot rests and seats are to be such as to allow clearance for legs so that they do not have to be angled in order to place you feet on them while in			



the seated position.			
<b>7.8 Console Utilities</b>			
<b>7.8.1</b> There is to be a 30 AMP shore power connection, complete with breaker and an electrical outlet inside the T-top.			
<b>7.8.2</b> There is to be a battery charger, with a minimum of 3 banks and 20 AMPs to charge batteries.			
<b>7.8.3</b> Battery connections will be arranged for cross connection of start and house batteries and for charging by motors and shore power when plugged into shore power.			
<b>7.8.4</b> All switches mounted on the dash and overhead communications panel shall be waterproof.			
<b>7.8.5</b> Main switch panel shall be of the waterproof and breaker style with a minimum of two spares.			
<b>7.8.6</b> All gauge back lighting shall be dimmable. Compass must be on a separate dimmable switch.			
<b>7.8.7</b> The T-Top must be equipped with a diesel heater (water heat piped from transom) capable of heating the windshield and the enclosed T-Top area of the vessel with a 20% reserve BTU rating; model 10DW ESPAR or equal.			
<b>7.8.8</b> Outlets from the diesel furnace must be located min. 2 in the aft face of the T-Top both port and starboard sides below the dash and 4 min facing the windshield.			
<b>7.8.9</b> The front windshield defroster(s) and heater must have a variable three-speed fan and be capable of clearing the entire front windshield area of the vessel. Heater switching and defrosting controls to be mounted on the dash, navigator's position.			
<b>7.8.10</b> The front windshield defroster must be capable of blowing both cold and heated air.			
<b>7.8.11</b> The fuel reservoir for the furnace must be approximately 10 litre capacity, (with marked diesel fill near lazarette box that must be lockable). (lazarette box doors must be lockable with a pad lock and able to be opened with a gloved hand.			
<b>7.8.12</b> Compass, map light and red LED lights shall be dimmable.			
<b>7.8.13</b> All switches are to be labelled.			

<b>7.8.14</b> Fuses and breakers are to be labelled.			
<b>7.8.15</b> Two charging 12 volt USB ports shall be provided on the dash.			
<b>7.9 Dash and Helm Station</b>			
<b>7.9.1</b> The Helm station will be on the Port side of the console, with controls on center.			
<b>7.9.2</b> The helm will incorporate a steering system, capable of handling the horsepower of the vessel, with manufacturers' engine controls designed for the power units.			
<b>7.9.3</b> There will be provision for an array of control gauges and electronic equipment at the helm position, see electronics section 8.7.			
<b>7.9.4</b> In addition, if not included with above gauge package, outboard trim gauges, and fuel level gauge(s) will be installed.			
<b>7.9.5</b> There will be a console mounted magnetic compass.			
<b>7.9.6</b> All lights switches and breakers must be within easy reach of the helmsmen.			
<b>7.9.7</b> In addition to the factory supplied individual propulsion leg trim controls there will be a SYNCRO trim switch to integrate the outboard controls on one switch.			
<b>7.9.8</b> Space required for future additional installations, e.g. for trim tab controls.			
<b>7.9.9</b> On either side of the throttle wedge there will be padding to avoid contact from legs resting on the foot rails while in the seated position.			
<b>7.10 Navigation Lighting and Equipment – LED options must be used where available.</b>			
<b>7.10.1</b> Blue and blue, mini light bar (Tomar 970L scorpion or equal) to be installed above the radar scanner, and to be approved by DFO TA.			
<b>7.10.2</b> Whelen Siren c/w Speaker to be mounted to the T-Top.			
<b>7.10.3</b> The Contractor must supply and install an electric horn that meets the requirements of the Collision Regulations. The horn must be operated by a spring-loaded switch located on the operators' console. The "Signaltone", or Ongaro electric horns meet this requirement.			
<b>7.10.4</b> Navigation lights must be permanently fitted to the T-Top with			

protected wiring and must be waterproof. The fitting of a combined navigation sidelight lantern on the inflatable collar will not be acceptable. All around mast /anchor light ratchet mast mounting is acceptable.			
<b>7.10.5</b> The fixtures must be of such a design as to resist the effects of vibration and must be provided with adequate protection from damage that may occur when lying alongside a vessel or a pier. (The Hella NaviLED Series of lights, including the NaviLED 360 all-round light , and NaviLED side lights meet this requirement.)			
<b>7.10.6</b> Non-white lighting must be wired together on a separate breaker of the 12 volt DC electrical system. All around Mast /Anchor light showing clear above the radar scanner as per TP 1332. One three way rocker switch, labelled "NAV" which turns on all Nav lights. When switched to the "ANC" side, only the anchor light is on.			
<b>7.10.7</b> Magnetic Compass: The Contractor must provide and install a direct read compass, with light and its own dimmer switch. (The Ritchie Helmsman 70 series meets this requirement.)			
<b>8.0 CONSTRUCTION</b>			
<b>8.1</b> Aluminum hull, deck, console and T-top.			
<b>8.2</b> Structural Integrity - All structures and components (hull, deck, collar, console, seating, etc.) must be of sufficient strength to withstand, when in a Maximum Load condition per builders' plate, the lateral and vertical impact loading that equates to the conditions of the operational profile and mission requirements			
<b>8.3</b> Hull shape must not impede water flow to the propulsion units and must direct spray and waves away from onboard personnel.			
<b>8.4</b> Watertight and Tank Bulkheads: The hull design must be such that a sufficient number of watertight compartments, including hull compartments, and/or low smoke and flame spread closed cell flotation foam, or fire retardant flotation, or flotation devices, will allow for adequate stability			

and positive buoyancy in a flooded condition. See references to vessel certification, re: TP 1332 / ISO testing.			
<b>8.5</b> Hull and Deck: The hull, and deck, must be constructed of Aluminium. Aluminium materials must be per Sec 3, Material and Construction.			
<b>8.6</b> The hull is to be a minimum 24 degree (transom) dead rise "V" style monohull with a reverse chine flat and hull bottom to incorporate minimum one substantial (~1.5" vertical, aft, located approx. mid bottom panel) or a combination of smaller spray strakes on the bottom, per side, which run out to the stem. Dead rise at 25% aft to hull transom from the main chine at stem must be minimum 32 degrees.			
<b>8.7</b> The hull and decks are to be transversely framed and longitudinally stringered (minimum of four per side).			
<b>8.8 Hull and Deck</b>			
<b>8.8.1</b> The T-Top must be fitted leaving sufficient unobstructed forward deck space to allow for securing a basket litter or similar device, with sufficient access alongside the device to carry out First Aid to a patient within. Sufficient unobstructed space must remain aft of the T-Top and seats to provide safe access to towing arrangements and propulsion equipment.			
<b>8.8.2</b> The layout of the T-Top must take into account ergonomic considerations, with easy viewing and access to all critical instruments and controls.			
<b>8.8.3</b> The deck to have high capacity, 4" dia. minimum, self-draining ports, and must be fitted with mechanical closures for the drains to prevent water ingress while the vessel is stopped, (elephant trunk style).			
<b>8.8.4</b> The deck above the watertight compartments must have bolted watertight centerline access plates / hatches for easy removal to allow for repair of tanks or buoyancy compartments beneath, and separate access plates for inspection access to the fuel system components as per TP 1332.			
<b>8.8.5</b> Buoyancy Foam- Must be Fire Rated (FR), or Low Smoke and flame spread, closed-cell foam installed to			

perform the required stability functions and isolated from fuel tank spaces by main girders or bulkheads with any foam accesses through these members closed by cover plates.			
<b>8.8.6</b> Fuel tank spaces to have ventilation flow through from bow to stern (ignition protected fan assist on start-up).			
<b>8.8.7</b> The deck is to have 4 lifting lugs that are out of the way of traffic and not a trip hazard.			
<b>8.8.8</b> Flush mounted deck tie downs must be fitted on the Tube Cradle in the forward deck area for the securing of deck cargo. (Minimum of 4 required.)			
<b>8.9 Stowage</b>			
<b>8.9.1</b> Arrangements must be provided for safe, secure and accessible stowage of an anchor, chain and rope, cable, paddles, and other equipment.			
<b>8.9.2</b> Weather tight stowage for small items of equipment must be provided in void spaces beneath seats, T-Top, and where practicable.			
<b>8.9.3</b> All exterior stowage compartments must be lockable with a pad lock, secured by positive means and operable by gloved or insensitive hands.			
<b>8.9.4</b> The configuration of these holds are explained in greater detail in sections 6.2.1.7 to 6.2.1.11.			
<b>8.10 Beaching Shoe</b>			
General description - Aluminum.			
<b>8.10.1</b> The bow must be constructed with aluminum armouring to allow hard rock beach landings while in a swell. It must protect the hull from damage when landing at low speeds.			
<b>8.10.2</b> Length - full length - from transom to underside of chine flat at bow.			
<b>8.11 Tow Eye</b>			
<b>8.11.1</b> A system is to be designed and incorporated into the construction of the stem that allows for the bowline and or trailering hook to be attached to the bow. The fitting must be T316 stainless steel and of sufficient strength to allow for towing the vessel at a speed of 20 knots in calm water in the normal loaded condition, on an even keel without damaging the vessel or causing undue chafing of the towline.			
<b>8.12 Tow Posts</b>			

The tow posts are to be stamped and highlighted with the Safe Working Load (SWL) of each post, clearly visible.			
<b>8.12.1</b> One tow post, for EMERGENCY towing, with towing bits must be fitted aft, rated for 3000 lb. (1360 kg.), it must be mounted in the transom to save deck space.			
<b>8.12.2</b> One removable cruciform tow post (tow capacity 3,000 lb. minimum) is to be fitted at the bow.			
<b>8.13 Collars</b>			
<b>8.13.1</b> Collar must be an inflatable type 24" diameter with at least 5 separate chambers of approximately equal volume, each fitted with a suitable inflation system and over-pressure relief valves calibrated to 3.5 psi. (the Halkey Roberts model 690BV inflation valve and the Mirada model B51019 3.5 psi over pressure relief valve, meet this requirement).			
<b>8.13.2</b> Inflatable collars fitted must be constructed of material that meets the criteria for strength, elasticity, resistance to wear and longevity as defined in TP 1324. Collar material must meet a minimum strength requirement of 1880 Decitex Neoprene / Hypalon coated nylon fabric and must be Neptune or Military grey in colour.			
<b>8.13.3</b> Inflatable collars must be attached to the hull using mechanical fasteners in such a manner that the collar can be easily removed for repair or replacement. The use of screws and lag bolts or glue-on type collars is not acceptable.			
<b>8.13.4</b> The inboard side of the tube, from the fastening flange up to the grab line flange is to be covered with a black EDPM from the front port side of the T-top all the way around forward to the starboard side of the T-Top.			
<b>8.13.5</b> Collar to be supplied with two pair of step treads (EPDM or eq.) installed in way of the cockpit access and a transom tube tensioner.			
<b>8.13.6</b> Inflatable collars must be provided with minimum 5 protective black wear strips all around, of extruded neoprene rubber, or equivalent, rubbing strakes (minimum 75mm wide, 'Bombard' style) to be glued along the entire length of the outboard side of the			

collar to provide protection against abrasion and puncture. The bottom of the inflatable collar wetted surface of the tubes must have a protective layer of material installed. (EPDM or equivalent.)			
<b>8.13.7</b> Grab lines of non-twisting nylon braided rope construction ½” diameter, must be fitted along the collar on both the port and starboard sides to provide access from both within the boat and for persons in the water. Grab lines must be mounted on the centerline of the collar, by means of a lacing cuff (not by D-Ring attachment.			
<b>8.13.8</b> Mechanical fastening of the tube set above the head log must be done with flush mounted fasteners. In addition, a piece of “D” rubber, the length of the head log is to be used at the base of the tube fastening. This will prevent a pinch point of the tubes. Should the bow section be placed against a solid object.			
<b>8.13.9</b> A repair kit must be provided for inflatable collars.			
<b>8.13.10</b> All seams are to be hand buffed and glued.			
<b>8.13.11</b> Polyurethane sealant should be used on all interior seams and baffle edge.			
<b>8.13.12</b> Foot pump, with correct valve fitting to be supplied (bellows type, for floatation collar.			
<b>8.13.13</b> A protective cover on the bow which will extend over the outer tube and extend from the bow to the down each side to opposite to the aft face of the bow. This cover is to be mechanically fastened at the bottom and fastened to the grommet strip (lacing cuff) at the top. . It should wrap the bow (collar only) from collar top centerline to collar/hull joint and extend approximately 4' (1.25M) aft down each side of the collar.			
<b>8.13.14</b> An operator activated semi-auto inflation system must be installed, to manually direct optimal inflation of all chambers. System must have hard plumbed manifold, with pressure gauge, and selection valving for chamber, and pressure valve for directing filling at up to 5 PSI. System to have a manual, ball valve actuated deflation of all chambers, operable from inside the T-top and			

discharging to exterior of cabin. 12 volt compressor to produce pressure and flow rate to inflate, all chambers being open, in 10 to 15 min. Pipe threaded outlet and filtered air intake required.			
<b>9.0 Outfitting Equipment</b>			
<b>9.1 Lifting</b>			
The vessel must be equipped with a four-(4) leg, webbing lifting bridle, which may require a spreader bar. The location and arrangement of lifting gear must be such that it does not pose a safety hazard to the operator or crew nor interfere with boat operation.			
<b>9.1.1</b> All bridle lifting lugs must be reinforced and proof tested in accordance with CSA Tackle Regulations and must comply with IMO regulations for 6:1 safety factors.			
<b>9.1.2</b> Lifting points must not be located below the deck or within lockers or compartments. Lifting points must be located in such a manner that they are out of traffic areas and are not a tripping or snag hazard.			
<b>9.1.3</b> Lifting points must be located so that the bridle does not snag on the boat structure, outfit or machinery			
<b>9.1.4</b> Lifting slings provided must be webbing strap type certified to safely lift the vessel in the Normal Loaded condition. Test margin 200% for four straps, or per CSA if higher standard.			
<b>9.2 Electrical</b>			
The electrical system design, component selection and installation must be in accordance with Canadian Standards Association C22.2 NO. 183.2-M1983 (R1999) "Standards for D.C. Electrical Installations on Boats", and TP1332 and/or ABYC 'E' as referenced by TP1332. All electrical equipment and hardware must be installed in accordance with the manufacturer's specifications.			
<b>9.2.1</b> Twelve Volt (12V) DC distribution system must be provided to power the engine starting and boat service loads including:			
<b>9.2.1.1</b> Navigation lights;			
<b>9.2.1.2</b> Exterior Lighting;			
<b>9.2.1.3</b> Navigational equipment;			
<b>9.2.1.4</b> Instrumentation;			
<b>9.2.1.5</b> Bilge Pumps			



<b>9.2.1.6 Electronics</b>			
<b>9.2.1.7 Communications; and</b>			
<b>9.2.1.8 Ancillary Items</b>			
<b>9.2.2</b> All fitted electrical equipment must be capable of operating simultaneously with any other fitted electronics equipment without causing interference to any electronic equipment or to the magnetic compass.			
<b>9.2.2</b> All electrical equipment must be readily accessible for performing maintenance.			
<b>9.2.3</b> Four (4) marine quality 12V power outlets one must be must be installed at or near the bow locker, one on the front of the T-Top, one on the back side of the T-Top console and one on the Lazerette near the transom. There must be two USB charging ports on the dash that are water resistant or covered.			
<b>9.3 Batteries, Cables and Charging Systems</b>			
Twelve (12) volt DC distribution system must be provided to power the engine starting and boat service loads including: <ul style="list-style-type: none"> <li>• Navigation, interior, and exterior lighting;</li> <li>• Electrical equipment;</li> <li>• Instrumentation, and</li> <li>• Bilge pumps and alarms.</li> </ul>			
<b>9.3.1</b> Batteries must be marine grade, 12 V, deep cycle maintenance free glass mat or gel type(no custom batteries), and with the ability to cross connect for twin-engine start-up of either engine from either battery where the system has a house battery in addition to the start batteries, the house battery shall be able to be joined to the start batteries if necessary. Some engine packages may require larger capacity for injection systems, see Sec.17, Outfitting.			
<b>9.3.2</b> Battery switch must be Certification Agency, (CE, CSA, USCG, etc.) approved and must be mounted to prevent snagging or accidental switching			
<b>9.3.3</b> Battery compartment must be weather tight and fitted with a suitable means of gas venting including for 'sealed' batteries.			
<b>9.3.4</b> Cables for all electrical distribution must be ample in size for the particular service, of marine grade tinned boat cable.			
<b>9.4 Cabling Installation</b>			

<b>9.4.1</b> Cables must be grouped into wiring harnesses wherever possible. All wiring harnesses must be routed below deck. All below deck cabling must be through conduit pipe.			
<b>9.4.2</b> Cabling / conductors passing through watertight boundaries, decks, bulkheads or other exposed surfaces must be installed to maintain watertight integrity of the structure. Cable entry into watertight enclosures must be through watertight marine glands of suitable size. All electrical equipment must be readily accessible for performing maintenance.			
<b>9.4.3</b> Cables and conductors must be supported with clamps or straps at least every 18 inches on horizontal runs and every 14 inches on vertical runs.			
<b>9.4.4</b> Cabling / conductors passing through structures without watertight glands, must be protected against chafing by the use of abrasive resistant grommets.			
<b>9.4.5</b> Routing cables through foamed spaces must be avoided wherever possible. Cables that must be routed through foamed spaces must be run in PVC conduit pipe. The pipe must be arranged in a manner that prevents water from becoming entrapped in the pipe.			
<b>9.5 Batteries, Cables and Charging Systems</b>			
<b>9.5.1</b> (2) Dedicated starting batteries for the outboard engines. Dual-battery system, minimum 750 cranking amps with dual-battery selector switch mounted in a recessed position that conforms to engine manufacturer's specifications.			
<b>9.5.2</b> One (1) battery for the house load, minimum 55 Ah/120 minute reserve capacity.			
<b>9.5.3</b> The starting batteries and the house battery must be positioned in the T-top console with a cover for each the three batteries. All Batteries must be group 27 or better Glass Matt or Gel. Batteries must be readily available commercial product (no custom batteries).			
<b>9.6 Utility Lighting – All lighting to be LED power management is critical due to volume of electronics.</b>			
<b>9.6.1</b> Contractor must supply two (2) handheld search lights for the vessel. Each light must be 12 volt and must			

produce 1 million candela. Four 12V power points required, one each on forward face, and dash (communication side) of console, and near the tow post forward, and at the transom.			
<b>9.6.2</b> The LED deck flood lights (6 of) of be fitted on the T-Top of the vessel, 2 facing towards the bow on the front corners, 1 each facing to the port and starboard and 2 facing towards the rear. Rigid brand or equivalent.			
<b>9.6.3</b> Tube cradle/ console (6) mounted LED deck illumination lights switchable from white to red.			
<b>9.6.4</b> There will be overhead red LED (4) and white LED (4) lights positioned over the console . There is to be red LED (4) and white LED (4) lights over the two aft seat positions. The red lights are to be dimmable.			
<b>9.6.5</b> Two recessed bow lights that are spot /flood combination made by Rigid or equivalent. To be place on either side of the bow below the tube set angled for slower speed travel 20-24 knots. Lights must not protrude from the hull and be waterproof.			
<b>9.6.6</b> Blue and blue, mini light bar (Tomar 970L scorpion or equal) to be installed above the radar scanner, and to be approved by DFO TA.			
<b>9.6.7</b> Whelen Siren c/w Speaker to be mounted to the T-Top.			
<b>9.6.8</b> The Contractor must supply and install an electric horn that meets the requirements of the Collision Regulations. The horn must be operated by a spring-loaded switch located on the operators' console. The "Signaltone" or Ongaro electric horns meet this requirement.			
<b>9.6.9</b> Navigation lights must be permanently fitted to the T-Top with protected wiring and must be waterproof. The fitting of a combined navigation sidelight lantern on the inflatable collar will not be acceptable. All around mast /anchor light ratchet mast mounting is acceptable.			
<b>9.6.10</b> The fixtures must be of such a design as to resist the effects of vibration and must be provided with adequate protection from damage that may occur when lying alongside a vessel or a pier. (The Hella NaviLED			

Series of lights, including the NaviLED 360 all-round light, and NaviLED side lights meet this requirement.)			
<b>9.6.11</b> Non-white lighting must be wired together on a separate breaker of the 12 volt DC electrical system. All around Mast /Anchor light showing clear above the radar scanner as per TP 1332. Two switches to be provided, labelled: Nav masthead / anchor and Nav sidelights.			
<b>9.6.12</b> Magnetic Compass: The Contractor must provide and install a direct read compass, with light and its own dimmer switch. (The Ritchie Helmsman 70 series meets this requirement.			
<b>9.6.13</b> Progressive dimmers of marine grade must be fitted wherever practicable, with the capability of dimming engine monitoring gauges if they are not dimmable by the manufacturer's controls and other indicators separately from compass illumination.			
<b>9.7 Navigation Electronics</b>			
This vessel must be constructed for contractor installation of the following Contractor Supplied electronics navigation package, with displays located across the forward dash, in addition to the Col regs required equipment. Arrangement to be approved by the Technical Authority.			
<b>9.7.1</b> NSS 16 EVO 2 Touch screen MFD, Built in Broadband/Chirp/Structure scan sounder, 10Hz GPS, HDMI video output. Mounted in navigator position.			
<b>9.7.2</b> NSS 12 EVO 2 Touch screen MFD, Built in Broadband/Chirp/Structure scan sounder, 10Hz GPS, HDMI video output. Mounted on pedestal between rear and front seats.			
<b>9.7.3</b> 4GBroadband Radar for Simrad NSO, NSE and NSS series includes Scanner, scanner cable 20m (66 ft), R110 interface box, Yellow Ethernet cable- 1.8m (6ft).			
<b>9.7.4</b> Airmar SS60 600W Thru Hull 50/200Khz.			
<b>9.7.5</b> LSS-2 transducer and 10ft extension.			
<b>9.7.6</b> NAIS 400 AIS transmit/receive/ gamss 2 Antenna.			
<b>9.7.7</b> NEP-2 Network Expansion Port			
<b>9.7.8</b> NMEA2000 starter kit x2			

<b>9.7.9</b> Navionics Gold 2XG Canada and US Charts.			
<b>9.7.10</b> ENET cable to join units together.			
<b>9.7.11</b> GS25 antenna/N2k Kit (for radar overlay).			
<b>9.7.12</b> Furuno GP32 independent GPS for the lap top.			
<b>9.7.13</b> GX2200 VHF with Hailer speaker to be installed.			
<b>9.7.14</b> Externally Mounted EPIRB ACR RLB-35 mounted on the rope guard screen on the self-righting arch.			
<b>9.7.15</b> Flir M625L, thermal imaging to be supplied and installed with interface to the operator screens.			
<b>9.7.16</b> Loudhailer with siren multifunction.			
<b>9.7.17</b> Whelen Siren and Speaker mounted to T-Top.			
<b>9.7.18</b> CF-31 Panasonic Toughbook with Nobltec location to be approved by the TA.			
<b>9.7.19</b> Laptop cradle Havis DS-Pan-112-2			
<b>9.7.20</b> GSM installation equipment:			
<b>9.7.21</b> Space and electrical capacity to be provided for a GSM Radio, Astro XTL 5000 with 03 Control head.			
<b>9.7.22</b> Location to be arranged for Laptop cradle and power supply for laptop, GSM intercom system to be installed by contractor, David Clark System.			
<b>9.8 Pumping and Drainage</b>			
<b>9.8.1</b> An electric bilge pump with 2000 gph capacity must be fitted in the main hull or largest watertight division as well as a fixed manual operated bilge pump of the diaphragm type. The bilge pump(s) must be located so that they take suction from the lowest point of the hull. Piping must be installed which will allow the bilge pump(s) to discharge directly overboard. Any additional watertight division of the hull will be serviced by a bilge pump of 1500 GPH capacity. The wire gauge for all bilge pumps must be a minimum of 10 gauge.			
<b>9.8.2</b> An automatic level sensor control must be fitted that turns on the electric bilge pump (Non-Pedal type) when water is present in the bilge. The electric bilge pump control switch must be located on the operator's console, with settings for 'momentary on', 'off',			

and 'automatic' operation. An indicator light must be provided at the control that lights when the bilge pump is operating.			
<b>9.8.3</b> High water alarm for the engine installation space, which could be the 'pod' for outboards, and every other space serviced by a bilge pump.			
<b>9.8.4</b> Hull drainage - a brass or stainless steel threaded plug must be provided in the lowest point to drain the hull when out of the water.			
<b>9.8.5</b> Valves and handles must be made of non-corroding materials and must be located where they are readily accessible for operation, maintenance or removal.			
<b>9.8.6</b> A raw water wash-down pump must be located in the lazarette with a hose that can be concealed in a self-contained unit. The pump must be switched to the operator's position on the dash.			
<b>9.9 Self-Righting System</b>			
<b>9.9.1</b> Self-righting system of proven design must be installed by certified self-righting system technician.			
<b>9.9.2</b> The self-righting system must employ a re-useable bladder and be a manually activated, self-righting system that will right an inverted RIB in no more than 15 seconds in air temperatures no less than -20° C.			
<b>9.9.3</b> The bladder must be stowed deflated in a quick release enclosure on the arch.			
<b>9.9.4</b> The framework must be constructed of materials and in such a manner to allow for a ten year lifespan without failure under normal operating conditions. At a minimum the materials must be made of 2" Schedule 40, type 5086 alloy.			
<b>9.9.5</b> A recovery line of at least 10M must be fitted to the engine guard, on the port side.			
<b>9.9.6</b> The activating handle will be located on the port side so that it is above the waterline when the boat is upside down.			
<b>9.9.7</b> The system must be a compressed air system fitted with suitable over pressure relief valves and an inflation valve c/w a gauge mounted on the valve. (The Mirada series 5000 firing head and gauge meet this			

requirement.)			
<p><b>9.9.8</b> The air bottle should be manufactured out of a rugged material that can withstand severe operating conditions. (The bottles Manufactured by Structural Composites Industries (SCI) and made of high pressure (4500 p.s.i.) GRP wrapped aluminum meet this requirement.)</p> <p>(<a href="http://www.scicomposites.com/custom_cylinders.html">http://www.scicomposites.com/custom_cylinders.html</a>). The bottle must not be mounted on the self-righting frame but rather in an area which is well protected from the elements but will still allow for ease of service and viewing of the pressure gauge.</p>			
<p><b>9.9.9</b> Any ancillary equipment fitted to the self-righting cage must not interfere with the efficient operation of the self-righting system.</p>			
<b>9.10 Lifesaving Emergency Equipment</b>			
<p>The following items must be provided with appropriate stowage / securing arrangements (as appropriate for each item). All CFM fittings must be heavy duty, corrosion resistant fittings. All items must be readily accessible (the foot pump and the repair kits must be stowed in a stowage locker). The Contractor will supply and outfit the boat with the following emergency equipment:</p>			
<b>9.10.1</b> Fire extinguisher (Class 5BC, marine type or better);			
<b>9.10.2</b> Boat hook, 8 feet long (retractable);			
<b>9.10.3</b> Two (2) paddles secured to the tube cradle as far aft as possible;			
<b>9.10.4</b> Anchor (Fortress model 7X or equivalent) and line with chain;			
<b>9.10.5</b> Drogue sea anchor and line;			
<b>9.10.6</b> Four (4) 25-foot ½" braided nylon mooring lines;			
<b>9.10.7</b> Collar patch kit (for inflatable collar);			
<b>9.10.8</b> Hull repair kit;			
<b>9.10.9</b> Foot pump (bellows type, for floatation collar);			
<b>9.10.10</b> One (1) water proof LED flashlight w/ spare batteries and bulb;			
<b>9.10.11</b> One (1) pealess whistle;			
<b>9.10.12</b> TC approved First aid kit in waterproof container;			
<b>9.10.13</b> Two (2) buoyant rescue quoits attached to 30m of buoyant line;			

<b>9.10.14</b> Three (3) Thermal protective aid;			
<b>9.10.15</b> Radar reflector, Mountable on cage, tube style;			
<b>9.10.16</b> Six (6) TCMSB approved flares, type A.B.C.; and			
<b>9.10.17</b> Buoyant safety knife with sheath and blunt tip			
<b>10.0 PROPULSION – TWIN OUTBOARDS</b>			
<b>10.1 Gasoline Outboards</b> Unless otherwise specified, outboard motors ONLY will be GOVERNMENT SUPPLIED MATERIAL (GSM) and Contractor installed. Twin Yamaha 300 HP 4 stroke engines, one engine counter rotating. The outboards must be installed and operated in accordance with the engine manufacturer's recommendations. The use of engine manufacturer's approved accessories and equipment is required except for motor control cables (which must be manufacturer's best quality cables). Equipment and components must not be used, nor Sea trials performed on the engines that would, in any way, void the engine manufacturer's warranties.			
<b>10.1.1</b> Outboard motors should be mounted as far apart as practicable.			
<b>10.1.2</b> Outboard motors must be mounted as per manufacturer's instructions.			
<b>10.1.3</b> The port outboard drive must be counter rotating.			
<b>10.1.4</b> Contractor to supply and install all digital gauge packs and associated equipment for the Outboards identified.			
<b>10.1.5</b> The Contractor must have the engine manufacturers' service agent inspect and verify the installation prior to trials and shipping.			
<b>10.1.6</b> Control cables, harnesses, propellers, and all other components will be Contractor supplied and installed.			
<b>10.1.7</b> Propulsion controls to be a single lever per engine with trim switches and syncro. The throttle box/wedge should have padding on either side to protect the operator's knees when in the seated position.			
<b>10.1.8</b> Propellers are Contractor supplied and must be stainless steel. The Contractor must identify, through calculation the pitch and diameter of the			



propellers to meet the Performance Requirements specified herein. This calculation will then be supplied to the Technical Authority upon completion of the contractors design check.			
<b>10.1.9</b> Kill Switch - Engine installations must incorporate an automatic shutdown feature (kill switch) for each engine to be mounted near the ignition switches. There must be one kill switch that kills both engines. Two (2) spare cords must be provided with each boat.			
<b>10.1.10</b> If the engines are mounted directly on the transom, the hull is to incorporate an integrated motor well into the hull-deck design, with tube support to the transom.			
<b>10.1.11</b> Run-in operation: The Engines must be installed and operated in accordance with the engine manufacturer's recommendations. The use of engine manufacturer's approved accessories and equipment is required. Equipment and components must not be used, or trials performed on the engines that would, in any way, void the engine manufacturer's warranties. The engines must have a minimum of 10 hours prior to delivery.			
<b>10.2 Outboard Motor Guard</b>			
<b>10.2.1</b> A guard made of welded 2" schedule 40, type 5086 aluminium pipe must extend out and around the outboard motors to protect them from impact. This guard must be fabricated so as to be easily removed in order to facilitate the removal of the outboard motors. The guard shall not extend past the transom more than is necessary to provide protection of the motors with minimal excess space between the motors and the motor guard.			
<b>10.3 Propulsion Controls</b>			
<b>10.3.1</b> Unless otherwise specified, gauges must be analogue-style, or Engine Manufacturers' digital equipment. Gauges must be sized and installed so they are readily visible by the operator while operating the boat.			
<b>10.3.2</b> All gauges must be backlit with an adjustable dimmer. Lighting for gauges and lighting for compass must use separate dimmers.			
<b>10.3.3</b> Propulsion control system installation must include single-lever			

combined engine control, for each engine, to be located at the operator's position on the starboard side of the control station. Controls must conform to engine manufacturer's recommendations for commercial use.			
<b>10.3.4</b> The Operator's position must be fitted with a lanyard style emergency shutdown switch which is attached to the operator and must shut down both engines if the lanyard is pulled from the switch.			
<b>10.4 Fuel Systems</b>			
<b>ALL FUEL SYSTEM HOSES TO BE USCG A RATED</b>			
<b>10.4.1</b> Fuel systems must meet with all requirements of TP 1332 "Construction Standards for Small Vessels", which reference the ABYC standards. Regardless of interpretation of TP 1332 requirements, below deck fuel tank compartment MUST have both passive and powered bow to stern ventilation system installed with clearly labelled switch at the helm.			
<b>10.4.2</b> The vessel must be fitted with two (2) fuel tanks with baffles, to be located under the deck for a total capacity of minimum ONE Thousand (1000) litres.			
<b>10.4.3</b> There must be inspection hatches (8") in the deck, to allow access to the fuel pick-ups, (with the required 'demand anti siphon' valve at the tank if flow rates meet the manufacturer's requirement), vent, and fill connections, and tank level indicators.			
<b>10.4.4</b> Arrangements must be provided for fuel tank and associated lines, vents, fills, and on / off valves, to be fitted to the boat.			
<b>10.4.5</b> Fuel lines from the required inboard shutoff valve or manifold to the outboard motor(s) to be protected against chafing and wear.			
<b>10.4.6</b> A fuel / water separator filter is to be mounted "in-line" to each engine with easy access to drain the sediment bowl.			
<b>10.4.7</b> Fuel shutoff maintenance valves are to be installed at filter/ manifold system and be easily accessible by vessel operators.			
<b>10.4.8</b> Fuel fills and vents to be located at forward bow locker location (other than diesel heater tank in transom) and must be properly labelled and lockable.			

<b>10.4.9</b> Valves and fittings used in the fuel system must be of non-corroding materials, and all fuel valves should be readily accessible and labelled.			
<b>10.4.10</b> Each fuel vent must be fitted with a ball check valve.			
<b>10.4.11</b> Bilge Blower: The gasoline tank space must be fitted with a 12V D.C. bilge blower system in excess of TP1332, controlled by a separate watertight switch on its own breaker at the control console.			
<b>11.0 STEERING</b>			
<b>11.1</b> Steering system must be remote hydraulic with self-contained oil reservoir, and replaceable seals on the rams, unless propulsion system builder requires alternate steering arrangement.			
<b>11.2</b> Hydraulic hoses must be of sufficient size and length to prevent pulsing. Hoses must be suitable for use in an exposed marine environment complete with stainless steel fittings			
<b>11.3</b> Steering systems must be hydraulic with a maximum of 3.5 turns from hard over to hard over. (The SeaStar® and / or DayStar steering systems, depending on vessel horsepower, from Teleflex meet this requirement). Particular propulsion systems may have their own requirements for steering which must be adhered to, eg. Jet steering systems.			
<b>11.4</b> All hydraulic steering hoses must be routed below deck and all hoses must be routed so that there are no pinch points on the hoses.			
<b>11.5</b> The wheel / console connection must be of robust construction, to eliminate fore and aft or lateral movement of wheel / steering shaft fixture.			
<b>11.6</b> The Steering wheel must be stiff enough that during rough water operations there is no flexing of the wheel and the wheel should be padded to provide a comfortable non-slip surface for the operator to grip. (Momo Marine steering wheels meet these requirements).			
<b>12.0 PAINTING AND PRESERVATION</b>			
<b>12.1</b> Aluminium components must have a painted finish (an approved powder coat process is acceptable) on all			

specified exterior and interior surfaces, comprised of suitable etch, primers, and topcoat. Typical single coat paint systems can be applied in the 5 to 7 mil thickness range per coating set. Typical system components would be: a) etch-primer; b) two coats of primer; and c) minimum double topcoat.			
<b>12.2</b> Hull and deck paint to be medium grey (RAL7042) except flat black specified areas or components, RAL9004. For colour guidance refer to "FC 08-2007: CANADIAN COAST GUARD FLEET IDENTITY COLOR STANDARD" which will be provided the contractor.			
<b>12.3</b> Deck finish must be non-skid paint system suitable for a marine environment to cover the entire deck except waterways and fittings.			
<b>12.4</b> Console finish must be painted in a matt black on the "interior" face, not including overhead and DFO grey on the exterior. All rough edges and sharp angled corners must be rounded and ergonomically adapted.			
<b>12.5</b> Prior to delivery the Contractor must ensure that all non-painted exposed aluminium is free of cosmetic blemishes, including all construction marks, scratches, gouges and stains.			
<b>13.0 SYSTEMS GENERAL</b>			
<b>Protection of Controls</b> All control cables, electrical wiring for the motor and the steering hydraulic hoses are to be installed in UV resistant plastic pipes (LOOM) or equal. These pipes are to be installed in such a manner as to ensure that no cable is immersed in water.			
<b>13.1 Cables</b>			
<b>13.1.1</b> Cables for all electrical distribution must be ample in size for the particular service, of marine grade tinned boat cable.			
<b>13.1.2</b> Cables must be grouped into wiring harnesses wherever possible. All wiring harnesses must be routed through protective conduit pipe. Where impractical cables and conductors must be supported with clamps or straps at least every 18 inches on horizontal runs and every 14 inches on vertical runs.			
<b>13.1.3</b> Cabling / conductors passing			

through watertight boundaries, decks, bulkheads or other exposed surfaces must be installed to maintain watertight integrity of the structure. Cable entry into watertight enclosures must be through watertight marine glands of suitable size.			
<b>13.1.4</b> Cabling / conductors passing through structures without watertight glands, must be protected against chafing by the use of abrasive resistant grommets.			
<b>13.1.5</b> Routing cables through foamed spaces must be avoided wherever possible. Cables that must be routed through foamed spaces must be run in PVC conduit pipe. The pipe must be arranged in a manner that prevents water from becoming entrapped in the pipe.			
<b>13.2 Piping Systems</b>			
<b>13.2.1.1</b> Fuel System must be air tested to 3.0 psi. and be labelled per the requirements of TP1332.			
<b>13.2.1.2</b> Fittings and clamps must be stainless steel. Bolts used in all fittings must be Type 316 stainless steel.			
<b>13.2.1.3</b> Each watertight Hull compartment is to have its own 12V DC bilge pump, plumbed to discharge overboard from the compartment, as per TP1332.			
<b>13.3 Navigation Equipment (COLREGS)</b>			
The following must be Contractor supplied and fitted:			
<b>13.3.1</b> Navigation lighting fixtures must be of such a design as to resist the effects of vibration and moisture and must be provided with adequate protection from damage.			
<b>13.3.2</b> Particular COLREGS rules to note (vessels under 12 M.); Rules 22, 23, and Annex 1, rules 2, 9, and 10. (NOTE: The lights must be installed parallel to the "Normal Load" waterline that often may not be parallel to the deck.)			
<b>13.3.3</b> The navigation lights must be mounted so as not to interfere with vision of the operator.			
<b>13.3.4</b> The navigation lights must be permanently mounted.			
<b>13.3.5</b> All navigation lights must display the arc and range of visibility as defined in the Canada Shipping Act, Collision			

Regulations.			
<b>13.3.6</b> Navigation lights must be permanently fitted to the T-top with protected wiring and must be waterproofed. The fitting of a combined lantern on the inflatable collar will not be acceptable.			
<b>13.3.7</b> The navigation light fixtures must be of such a design as to resist the effects of vibration and must be provided with adequate protection from damage, which may occur when lying alongside a vessel or a pier. (The Hella NaviLED meet this requirement.) A single all-round light for Masthead / Stern light is acceptable, mounted on a folding / detachable stanchion 1M above sidelights. LED navigation lights may be used.			
<b>13.3.8</b> The Contractor must supply and install an electric horn that ensures the requirements of the Collision Regulations, Rule 32 are met, i.e. with a standard small vessel 'horn' audible 0.5 NM. The horn must be installed on the vessel exterior with the 'horn' facing forward. The horn must be operated by a spring-loaded switch located on the operators' console. At a minimum a BRP 120 db horn must be installed.			
<b>13.3.9</b> A Magnetic Compass must be mounted near the centreline of the helm station, in easy view of the operator when facing forward.			
<b>14.0 TESTS &amp; TRIALS</b>			
The Contractor must conduct their own inspections, tests and trials to verify successful completion of the Work in accordance with this TSOR and the proper operation of the vessel and all associated equipment. The requirements for inspections, tests and trials and associated deliverable documentation are defined in the Contract and Annexes to the Contract including any test, trials or sample reports attached thereto. All discrepancies identified through the inspection, test and trials processes must be corrected prior to delivery.			
<b>14.1.1</b> The Contractor must, as a minimum, inspect and test the following items for adherence to the contract requirements and proper operation			

(proper operation means that the equipment can be started, operated, connected together and demonstrated to function in a normal fashion, as applicable). The inspections and tests listed herein are minimums and are not intended to supplant any controls, examinations, inspections or tests normally employed by the Contractor to assure the quality of the vessel:			
<b>14.1.1.1 Weight</b>			
<b>14.1.1.2 Construction Quality</b>			
<b>14.1.1.3 Lifting Gear, if applicable</b>			
<b>14.1.1.4 Propulsion Engines, including starting</b>			
<b>14.1.1.5 Propulsion Controls</b>			
<b>14.1.1.6 Steering System</b>			
<b>14.1.1.7 Fuel System</b>			
<b>14.1.1.8 Electrical System</b>			
<b>14.1.1.9 Electronics</b>			
<b>14.1.2 Sea Trials</b>			
The minimum acceptable sea trial and report is as attached hereto, ATTACHMENT I OF APPENDIX II.			
<b>14.1.3</b> A copy of the stability calculations and documentations as previously submitted must be provided for the Technical Authority.			
<b>14.1.4 Trial Records and Reports.</b> The requirements for recording and maintaining trials records are given in the Contract and applicable Annexes			
<b>14.1.5 Deliverable Documentation:</b> The requirements for deliverable documentation are given in the Contract and applicable Annexes.			
<b>15.0 BUILDER'S PLATE</b>			
<b>National Asset Code</b>			
<b>15.1.1</b> The National Asset Code for these vessels is provided in Annex B.			
The contractor must add this 5 character code to the builder's plate of each vessel with the prefix "National Asset Code".			
<b>15.2 Builder's Plate</b>			
<b>15.2.1</b> Must comply with Transport Canada TP 1332 requirements as a minimum.			
<b>15.2.2</b> A Builder's Plate must be affixed to each asset in a readily visible location, e.g. for a boat, in way of the helm position, for a trailer on the left side of the tongue.			
<b>15.2.3</b> The plate must be made of a			

weather resistant material compatible with that to which it is affixed.			
<b>15.2.4</b> The dimensions of the plate must be not less than 200mm x 125mm			
<b>15.2.5</b> The plate must contain the following information, permanently etched:			
<b>15.2.5.1</b> National Asset Code;			
<b>15.2.5.2</b> Naval Architect/Designer;			
<b>15.2.5.3</b> Builder;			
<b>15.2.5.4</b> Hull Number;			
<b>15.2.5.5</b> Year of Construction;			
<b>15.2.5.6</b> Lightship Weight in kilograms.			
<b>15.2.6</b> The Builder's Plate must be in both official languages.			
<b>16.0 SHIPPING AND DELIVERY</b>			
Prior to shipping, the boat is to be cleaned, appropriately protected and covered in accordance with the instructions specified in this section.			
<b>16.1</b> Prior to shipping, the boats must be secured on their respective trailers, cleaned, preserved and covered in accordance with this section. All areas of the boat are to be cleaned prior to covering for shipping. Bilges are to be dry and free of oil and debris and the fuel tanks must be full with fuel stabilizer added.			
<b>16.2</b> The propulsion system must be preserved in accordance with the manufacturer's recommendations for storage of up to one year in an environment that will be subjected to freezing temperatures.			
<b>16.3</b> The batteries are to be disconnected. A warning plate is to be tied to the steering wheel with a wire indicating that the boat has been protected for shipping and storage and must not be started until the propulsion machinery has been reactivated.			
<b>16.4</b> All contact points with the boat are to be padded. A shrink wrap cover is to be provided to protect the boat during shipping and storage.			
<b>16.5</b> Means of Delivery: For a delivery distance not exceeding 1000 km the Contractor may deliver the vessel/trailer combination on the trailer. Where the delivery distance exceeds 1000 km the trailer may not be utilized as means of delivery			



<b>17.0 WARRANTY AND SERVICE PROVISIONS</b>			
<b>17.1 Components and Equipment Support</b>			
<b>17.1.1</b> All components and all mechanical, auxiliary, electronic and electrical equipment installed on the boat, with the exception of the collar, must be supportable by parts and service in Canada within 30 days. A collar, if any, must be supportable by parts and service in Canada within 30 days. All components and equipment must be current models.			
<b>17.2 Spare Parts</b>			
<b>17.2.1</b> To facilitate replacement and inter-changeability of parts, as well as maintenance procedures and operator training wherever practicable the Contractor must standardize on selection of equipment, fittings and fabrication methods within all boats supplied.			
<b>17.2.2 Parts and Service Depot(s)</b>			
<b>17.2.2.1</b> Contractor's parts depots must be capable of efficiently supplying all British Columbia with spare parts for all components of the vessel and warranty service for all components of the vessel. It is recognized that many equipment items will have their own manufacturer's warranty cards for owner registration. Contractors must have a factory authorized service representative capable of call back response in all regions of Canada within 48 hours of receiving a service call.			
<b>18.0 TRAILER</b>			
<b>18.1</b> A trailer with a boarding ladder (w/square tube for rungs with non-skid material and each rung) and hand rail secured to the tongue trailer allowing ease of access to board the boat while it is on the trailer but does not impact or impede the ability to trailer the vessel. Is to be rated at least 20% over the anticipated 'normal load' weight of the boat, and to be specified as follows:			
<b>18.1.1</b> Capacity to be minimum 10,000 lb. Welded galvanized construction.			
<b>18.1.2</b> 15 inch 6 bolt wheels with disc brakes, carrying 225 / 75R / 15D tires with 'E' load rating.			
<b>18.1.3</b> Double axle, with axle bearing protection, grease nipple.			

<b>18.1.4</b> Brake, and turn signal lighting, with wiring to be copper tinned and have a 7-prong round wiring connector.			
<b>18.1.5</b> Electric / hydraulic, jurisdiction compliant braking system; (Note braking system proposed, if other than stated requirement).			
<b>18.1.6</b> Electric / hydraulic, jurisdiction compliant braking system; (Note braking system proposed, if other than stated requirement).			
<b>18.1.7</b> Manual, two speed bow winch assembly with winch webbing strap, bow chock, and swivel tongue jack, (2500 lb.) with wheeled foot.			
<b>18.1.8</b> Trailer to be fitted with heavy-duty 'stand-on' fenders, and hitch to accommodate a 2 5/16" ball.			
<b>18.1.9</b> Trailer to have multiple roller assemblies, and spare tire and carrier, with lug wrench.			
<b>18.1.10</b> Trailer to be supplied with two (2) ratchet tie down straps with hooks securing boat to trailer aft. Turnbuckle to be provided for securing boat to trailer forward. Securing eyes must be sufficient in size to allow for large ratchet hooks to fit inside when securing the vessel.			
<b>18.1.11</b> Stainless steel calipers, mounting brackets and rotors with the appropriate brake pads.			
<b>18.2</b> The contractor must record the trailer sales and registration information and provide the information in each vessel manual.			

## APPENDIX I - FINAL DELIVERABLE DATA PACKAGE

The Final Data Package which must be delivered to Canada is as defined in the Contract, but must include, as a minimum the technical publications identified in this appendix.

### 1.0 Comprehensive Owner/Operator Manuals

#### 1.1 Deliverables

<b>1.1.1</b> One (1) complete hard copy and one (1) complete CD electronic copy set of the manuals per vessel delivered for the operator of each vessel, to be delivered with the vessel.			
<b>1.1.2</b> One (1) complete hard copy and one (1) complete CD electronic copy set of the manuals per vessel delivered for the Technical Authority, to be delivered to the same address identified for			

invoices.			
<b>1.2 Content</b>			
The manuals must provide a physical and functional description of the craft, it's machinery and equipment, as well as delivery testing and sea trial result documentation. The manuals must include as a minimum the following three sections and as detailed below:			
<ul style="list-style-type: none"> <li>• General Information</li> <li>• Technical Information</li> <li>• Spare Parts List</li> </ul>			
<b>1.2.1 General Information Section</b>			
The General Information Section must include a description of the arrangement and function of all structures, systems, fittings and accessories that comprise the boat, with illustrations as appropriate:			
<b>1.2.1.1</b> Operating procedures;			
<b>1.2.1.2</b> Basic operating characteristics (such as temperatures, pressures, flow rates);			
<b>1.2.1.3</b> Installation criteria and drawings, assembly and disassembly instructions with comprehensive illustrations showing each step;			
<b>1.2.1.4</b> Recommended planned maintenance; and			
<b>1.2.1.5</b> Complete troubleshooting procedures.			
<b>1.2.2 Technical Information Section</b>			
The Technical Information Section is a complete set of detailed owner / operator instructions, drawings (Section 15), parts lists and supplemental data for all components of the boat (whether acquired from external sources or custom-manufactured).			
<b>1.2.2.1</b> "As Fitted", dimensioned drawings must be produced for manuals to record the vessel particulars.			
<b>1.2.2.2</b> "Plan and Profile, showing the General arrangement; and			
<b>1.2.2.3</b> Indication of the Systems arrangement presented with the above drawings covering Bilge, Fuel, Electrical, and propulsion installations.			
<b>1.2.2.4</b> Parts list must include the name, part number and serial number if applicable of the parts, items or components and must indicate the supplier (name, address, phone number, email address) of this part, equipment or component and in which part of the specification the item appears.			
<b>1.2.2.5</b> Hull Serial Number (HIN), copy of builders plate, TEST and TRIAL results as per completed Attachment 1			

of Appendix II, serial or manufacturer's numbers, and equipment warranty cards.			
<b>1.2.2.6</b> Engine(s) and equipment: including engine and propulsion serial numbers.			
<b>1.2.2.7</b> Collars; including collar material and glue materials and procedures necessary for onboard repair of the collar.			
<b>1.2.2.8</b> Acceptance Certificates, and compliance sheets or certificates distributed with equipment i.e. life saving appliances, lifting appliances, engine test reports, calibration certificates, Nav light certificates, Fire suppression material certificates, flotation foam rating sheets.			
<b>1.2.2.9</b> Pre-trial shop Testing Check Sheet.			
<b>1.2.2.10</b> Electronics, (if applicable): including model and serial numbers.			
<b>1.2.2.11</b> Regulatory and Stability documentation: as required per TP 1332, which, references ISO12217 or ISO 6185 for RIBs (if applicable).			
<b>1.2.3 Spare Parts List Section</b>			
The Spare Parts List section must include a list of recommended initial onboard spare parts to be stocked for the vessel. The list must include the name, part number and serial number if applicable of the parts, items or components and must indicate the supplier (name, address, phone number, email address) of this part, equipment or component and in which part of the TSOR the item appears. At a minimum this list must include the following items (as applicable):			
<b>1.2.3.1</b> Propulsion: Propellers, filters, water pump impeller, batteries, throttle and shift cables, special engine tools;			
<b>1.2.3.2</b> Electrical: Panel breakers, fuses, light bulbs;			
<b>1.2.3.3</b> Boat Structures and Fittings: Miscellaneous commonly used fasteners.			
<b>2.0 Additional Deliverable Documentation</b>			
The following additional documentation must be delivered with each vessel:			
<b>2.1</b> Tonnage Registration Certificate in accordance with TP 13430 - <a href="http://www.tc.gc.ca/eng/marinesafety/sv_cp-qt-3948.htm">http://www.tc.gc.ca/eng/marinesafety/sv_cp-qt-3948.htm</a> .			
<b>2.2</b> A completed and signed copy of the Small Vessel Compliance Program SVCP for the vessel delivered. Website: <a href="http://www.tc.gc.ca/eng/marinesafety/sv_cp-menu-3633.htm">http://www.tc.gc.ca/eng/marinesafety/sv_cp-menu-3633.htm</a> .			
<b>2.3</b> Two (2) Bill of Sales per vessel delivered, one for the vessel and a			

second for the trailer with a valid Motor Vehicle Registration Certificate for the relevant Province of delivery.			
<b>APPENDIX II - SEA TRIALS</b>			
<b>1.0</b> Sea trials must be conducted by the Contractor to demonstrate the vessel and its equipment conform to the requirements as stated in the Contract. All expenses incident to the trials must be borne by the Contractor, including fuel unless otherwise specified. A crew provided by the Contractor must operate the vessel during sea trials. Residual fuel, if not drained for shipping, must be delivered in its tank with the vessel.			
<b>2.0</b> All Sea Trial instrumentation and equipment must be furnished and operated by the Contractor. Trial instrumentation, where applicable, must not replace the vessel's instruments (e.g., engine tachometer, pressure gauges, and thermometers). The Contractor must furnish all necessary hardware and fittings and must install the measuring devices. After satisfactory completion of the trials, all instrumentation must be removed and all systems restored to their original condition. The Contractor must provide two (2) copies of the calibration data certifying the accuracy of the instrumentation for the tests and include it in the technical publications.			
<b>3.0</b> The Contractor is required to run the vessel during the builders trials until the engine(s) have accumulated their operational hours (20 hours approximately) sufficient for the initial service by the engine manufacturer's service agent and perform the initial service and provide a report of the service.			
<b>4.0</b> The Contractor must submit a Test & Trials Plan, including a description of all of the acceptance trials to be performed. As a minimum, Using Attachment I, modified to suit these vessels, the following trials must be conducted: (the vessel must operate in the Normal Load Condition):			
<b>4.1.1</b> Speed Trials - The speed trials must be done over a course at least one (1) nautical mile in length. Two (2) runs must be made over the course, one (1)			

in each direction with the speeds for the two (2) runs averaged. The use of GPS data (averaged) is acceptable.			
<b>4.1.2</b> Endurance Trial - The boat must operate at maximum speed for a minimum of ten (10) minute intervals in the Fully Loaded Condition over one (1) hour period considering the break in procedures of the equipment. During the endurance trials, it must be demonstrated that all parts of the propulsion system are in full operation. All systems must be operated to check for proper lubrication, control and alignment. Fuel consumption must be recorded for the one-hour trial.			
<b>4.1.3</b> Astern Propulsion - The vessel must be operated and manoeuvred using astern propulsion to establish the astern performance. During the backing performance tests the throttles must be set to provide 1/3 of the rated engine horsepower. In order to demonstrate astern performance of the engines in an emergency stop and to test the strength of the foundations, the engine must be subjected to two stops from full power ahead at maximum speed to dead in the water using reverse thrust. Time required to perform this trial must be recorded.			
<b>4.1.4</b> Steering Gear - Tests must be conducted on the steering gear to demonstrate the adequacy of the steering system under all operations. Manoeuvring tests must be performed to ensure that the vessel meets the stated requirements. Manoeuvring trials must be conducted in the Normal Load Condition and repeated in the Full Load Condition.			
<b>4.1.5</b> The Contractor must provide a Tests & Trials Sheet, (Attachment 1) for each boat and include this sheet in the technical publications.			
<b>4.1.6</b> Public Works and Government Services Canada Contract Authority and Technical Authority must be notified no less than 2 weeks prior to sea trials. The Technical Authority will witness and attend the sea trials. Sea trial results must be forwarded to the Technical Authority prior to delivery of the vessel.			
<b>4.1.7</b> At the conclusion of sea trials each vessel must be thoroughly cleaned and inspected. Engine cooling systems must			

be flushed through with fresh water. The Contractor must repair any damage to the vessel or ancillary equipment resulting from sea trials, to the satisfaction of the Technical Authority.			
<b>4.1.8</b> For the purpose of the trials, Normal Loaded Condition must be considered to be the basic vessel, fitted with all normal equipment, full fuel, with complement and loads per Vessel Particulars, <b>(see section 4.1.9).</b>			

Evaluator Name: \_\_\_\_\_ Date: \_\_\_\_\_

Evaluator Name: \_\_\_\_\_ Date: \_\_\_\_\_

Evaluator Name: \_\_\_\_\_ Date: \_\_\_\_\_