C/M	¥	Proposed OBs/Technical Specification	Trial Directive / Procedure
0		Floposed QKS/ Technical Specification	suggested for trial for Board of Officers
1.	Overview	The boat shall be utilized for coastal patrol and surveillance with the aim to protect area of Haraminala, Creeks of Gujarat and area between Medi & Jakhau, costal area of India and inland water including Brahmaputra river & Sunderbans Delta of Bengal. The boat shall be highly seaworthy. The boat shall have propulsion, power generation, lifesaving & other engineering and electrical systems to carry out safe and reliable operation to perform the various functions as under:- a) Patrol in shallow coastal waters. b) To carry out coordinated secure operations and Force Protection, Vessels, other crafts/boats deployed. c) Seaward anti-terrorist patrols for security of coastal/inland installations, own vessels and own coast line. d) Search and Rescue.	Water trials may include operation in shallow water during day and night at users place.
2.	Class	Fast Patrol Boat shall be designed & constructed as per IRS rules class notation SWASTIC, SU, HSLC, RS-2 or equivalent for construction of patrol boat for operation within 12 nautical mile from coast having sea condition such that the design significant wave height of sea state-3. Boat should have V shape planning hull with optimum dead rise angle to meet the desired speed and stability requirements.	Examine the class certificate issued by classification society with the specified Class Notation for compliance.
3.	Capacity	Fast Patrol Boat shall have a capacity of 08 people on board including Crew. The boat shall be fitted with two out board motors (OBMs) of sufficient Horse power to generate speed in environment conditions mentioned below.	Check with 08 people load.
ł.	Environmen tal Condition	The equipment and machinery fitted on FPB should be suitable for marine applications and capable of satisfactory operation, under the following environmental conditions:- (a) Wind speed 10-30 knots (b) Ambient Air Temperature from zero to +50 degree C (c) Water temperature from 01 degree C to 40 degree C (d) Max relative humidity of 90% at 32 degree C (e) Salinity of water up to 36 PPM.	Check the condition of environment.
5.	General Feature	<ul> <li>(a) The FPB should be capable of operating in shallow waters in extreme tropical conditions in creeks of Gujarat and inland water. The depth of creeks varies from 0.9 mtr to 20 Mtr.</li> <li>(b) The FPB should be able to have sustained operation of 06-08 hrs per day with an annual exploitation of 600 hrs.</li> <li>(c) The FPB should have a Service Life of 15 years for structure and hull of the boat.</li> </ul>	Check the running of the boat.

S/N o		Proposed QRs/Technical Specification	Trial Directive/ Procedure suggested for trial for Board of Officers
		<ul> <li>(d) Ergonomics- Latest design concepts for boats, with respective ergonomics and crew comfort are to be included.</li> <li>(e) General instruction- Preliminary stability calculation, poweresistance &amp; endurance calculations General arrangement plan of boat along with lay out of major machinery/equipment &amp; system are to be submitted along with technical offer.</li> </ul>	t to wer, ents nt's
6.	Operating	The FPB shall conform to the following operating profile:-	Check the running of the boat.
	Profile	S/N     Speed     Nos     of     Operating time       o.     Hrs     Hrs	
		A From 30 knot to 35 60 hrs 10% of annual exploitation	the provide state of the second
		BFrom 25 knot to 30240 hrs40% of exploitation	
	Section into	C From 15 knot to 25 180 hrs 30% of annual exploitation	
	We want	D From 5 knot to 15 120 hrs 20% of annual knot exploitation	
7.	Speed	<ul><li>(a) 35 knots at sea state-2 with 04 POB including crew.</li><li>(b) 29 knots at sea state-2 with 08 POB with personnel weapon</li></ul>	To be physically measured in creek and water after loading the boat with 4/8
		equipments at full load displacements.	pers with all equipments @ 80 Kgs per person during sea trial with help of GPS and stop watch. Speed trails need to be undertaken with and against tide/current using standard procedure.
8.	Seaworthine ss	The boat should have seaworthy to patrol with reduced performance. Sea State 3 and adequate stability up to Sea State-4.	e in Check the boat in Sea state 3 and 4.
9.	Supervision during Constructio n	As the boats are being built to class, these would be inspected by Classification Society. The Owner reserves the right to undert additional inspections either directly or by third party. Boat buil would be required to provide all inspection facilities at yard premise the inspecting team. Periodic reviews by the Owner would conducted for ascertaining work progress by a team include technical member from user end.	the Stage wise supervision may carried ake out as per owner requirement. Ider s to be ling
10.	Life Time support	The Shipyard is to obtain a Contractual commitment from the vari equipment suppliers to provide Product support for a minimum per of 10 years including electronics, after delivery of the last FPB. In of the equipment is likely to become obsolete, the manufacturer of be should be committed to give a clear three year notice to the user.	ous Confirm from boat builder. riod case boat

S/N	2 10 0 10 0 10 10	Proposed QRs/Technical Specification	Trial Directive/ Procedure
0			suggested for trial for Board of Officers
11.	Dimension	<b>Length of Hull</b> Without appendages, OBM & bowsprit- 6.2 mtr to 6.5 Mtr	Check with measuring steel tape in calm water and tally with approved drawing. Check line plan and general arrangement drawings.
		Breadth Overall 2.5 mtr ± 30 cm	Check with measuring steel tape in calm water and tally with approved drawing. Check line plan and general arrangement drawings.
		Draft Light Ship draft- W/o OBM- 0.400 mtr (AFT) Light Ship draft- W/o OBM- 0.200 mtr (FWD) Mean draft not more than 0.4 mtr with full load. Boat should have optimum dead rise angle to meet the speed & stability criteria at Creek, Sea coast and inland water of India.	Check with measuring tape after loading the boat with 08 pers with all equipments @ 80 Kgs per person and tally drawings.
		Depth According to the Design.	Check with measuring tape and tally with approved drawing. Check lines plan and general arrangement drawings.
		Weight Not more than 1100 Kg (without OBM) The design corresponding to the other criteria like speed, endurance, stability etc be met. The material and FRP construction to meet out the weight criteria should be followed by the boat builders to meet the class requirement.	Check in the weighting machine as per design.
12.	Compliment	08 persons including Crew along with personnel weapon and equipment.	To be physically checked after loading the boat with 08 pers with all equipments @ 80 Kgs per person.
.3	Hull	<ul> <li>(a) The shall be constructed in accordance with classification society rules and shall be of single piece mould with smooth mat finish scratch proof Gel Coat outer finish in single mould.</li> <li>(b) Under deck includes longitudinal and transverse stiffeners and sub division bulkheads, with anti-flooding and damage control as per class requirements.</li> <li>(c) To have minimum draft for easy beaching and sail in shallow water. Bottom should be strengthened for this purpose.</li> <li>(d) Glass reinforcement plastic materials used in construction of the boat with comply with following standard:-Gel coat- IRS/IACS members approved</li> </ul>	<ul> <li>a) Check the hull physically in presence of IRS rep. It should be as per class society recommendation.</li> <li>b) Certificate to this effect be obtained from the builder.</li> <li>c) Check with measuring tape.</li> <li>d) Material type approved certificate to be submitted by builder.</li> <li>e) The inclining experiment of the first boat is to be carried out if applicable as per class requirement.</li> <li>f) Check in prototype inspection</li> </ul>

S/N o	and the second	Proposed QRs/Technical Specification	Trial Directive/ Procedure suggested for trial for Board of Officers	
		<ul> <li>(e) The hull should be strengthened to resist the slamming effect of the water waves as per sea state specified in QRs.</li> <li>(f) The construction of the boat should be done in controlled temperature/humidity to gain the best lamination property.</li> <li>(g) Under floor buoyancy as per class requirement</li> </ul>	h) Check in prototype inspection.	
14.	Fender	Boat shall have compact/good quality/heavy duty rubber fender with suitable shape corresponding to the design all around the boat. 04 Nos. pneumatic fender to be provided.	Check fender for adequacy/location as per approved drawing. Check class approval certificate for materials.	
15.	Accommoda tion	<ul> <li>a) Shock mitigating high adjustable seats for Helm's Master &amp; Co-Driver, suitable hand grip shall be provided in from of co-driver and 03 seats each at STBD side &amp; Port side padded seats with back rest.</li> <li>b) The area below deck forward of the helm provides a storage area, or could be used as a small cabin with bunks or as a gunner's station.</li> <li>c) Walk through wind screen to be provided.</li> <li>d) Detachable with locking system, LMG mounting post at forward deck to be provided with comfortless to the gunner.</li> <li>e) Provision of seat belt, hand-rails and toe grips.</li> </ul>	<ul> <li>a) Check Shock absorbing capacity of seats during speed trial.</li> <li>Ascertain comfortable sitting by 06 people on port &amp; stbd site.</li> <li>(b), (c) check physically.</li> <li>e) Physically check hand rails, belt and toe grips.</li> </ul>	
16.	Electrical	<ul> <li>(a) Power should be sufficient to charge the battery system</li> <li>(b) Battery should be placed in the boxes suitability fixed.</li> <li>(c) The marine application battery with sufficient power to start the OBM and operate the navigational lights and accessories.</li> </ul>	a) Check gauge b) & c) check physically	
17.	Floor	Anti-skid floor/deck and all surfaces shall be minimum maintenance and easy to clean. The areas of loor/deck shall have adequate handholds where ever required.	To be physically checked as per approved plan/drawing.	
18.	Life Saving and fire fighting Equipment	<ul> <li>i) 04 Nos Hazardous Duty Life Jackets as per Indian Navy Standard attached as Annexure I to QRs or equivalent.</li> <li>(ii) Life jackets- 09 Nos SOLAS approved type.</li> <li>(iii) Life Buoy- 02 Nos SOLAS approved type.</li> <li>(iv) Fire extinguisher as per class approved.</li> </ul>	<ul> <li>Lay out the buoys/jackets count.</li> <li>Check class approved certificates.</li> <li>Random testing of kit/life jackets be done to ensure functionality.</li> <li>Check pressure test certificate of fire fighting extinguisher.</li> </ul>	
19.	Engine	The FPB shall be fitted with Twin Four Stroke petrol Out Board Motors (OBM) reputed make not less than 90 HP each with suitable propeller. The FPB shall be fitted with remote wheel with suitable hydraulic steering system, remote trimming and tilting arrangement for engine and throttle/gear controls, tachometers, engines hour-meters, engine water temperature gauges, battery meters, and boat speed indicator,	Engine performance to be checked during speed trial. Check functioning of all instrument panel. Check panel remote till & trim arrangements. Start stop engine 6-8 time and specific gravity and batteries to be	

S/N o		Proposed QRs/Technical Specification	Trial Directive/ Procedure suggested for trial for Board of Officers
		oil temperature. Oil pressure meter etc. OBM should be of world reputed make/model with advanced technology. The OBM should install along with all meter and accessories as per the OEM specification and instructions as per the manual. The OBM should have service facility in India with establish network of dealer and service centre.	tested before and after engine start.
20.	Endurance	The Fast Patrol Boat should have endurance of 04 Hrs of continuous operation without refueling at the speed of 25-30 knots with full load.	Distance travelled & consumption of fuel to be recorded. 02 hours average Range/Endurance trial to be carried out with 08 pers alongwith all equipment @ 80 Kgs per person during sea trial with the help of GPS.
21.	Fuel Tanks	Two below-floor high quality FRP/Plastic fuel tanks of capacity to meet the endurance with extra 10% reserve shall be fitted. Fuel tank shall be fitted centre of the boat with proper hatches having cleaning facility. A fuel gauge for each tank shall be fitted having display on the instrument panel. Each tank shall apply only to its own-side OBM, which shall provide separation and redundancy in the fuel supply in case of contamination, damage etc. However, a synchronization system shall be provided to allow both OBM to be run with either tank in emergency in case of one fuel tank supply chocked. Two 25 Ltrs UV- resistant polyethylene fuel tanks may be stowed in addition for emergency use along with the accessories. Proper vent to be provided for de-vaporization. Water Separator and filter detachable and transparent OEM of OBM make to be installed (to drain the separated water time to time).	<ul> <li>(a) Check fuel capacity meets endurance requirement. Material Certificate issued by class society/builder be obtained.</li> <li>(b) Check additional uv-resistant fuel tank capacity.</li> </ul>
22.	Navigation/ Communica tion- approved type	<ul> <li>a) Simple bracket-mounted magnetic compass shall be fitted to the instrument panel.</li> <li>b) Removable type bracket mounted hand held GPS system with Colour Display unit.</li> <li>c) Suitable place for installation of VHF set bracket for fitting to its antenna.</li> <li>d) Navigational light to be provided port/STBD side, and to be placed at a position to prevent damage from stacking at jetty.</li> <li>e) One 150 mm/100 W hand held search light to be provided and facilitated to connect by 5 meter cable from panel arrangement run by on board battery.</li> </ul>	<ul> <li>a) Check magnetic compass.</li> <li>b) Check functioning of GPS, check correctness of GPS reading by compass.</li> <li>c) Check mounting of VHF set/antenna.</li> <li>d) Check all navigational lights are functional.</li> <li>e) Physically checked.</li> </ul>
23.	Lifting/Lash ing	Four lifting points at freeboard top (freeboard should be strengthened accordingly) with single lifting center shall be provided for quadruple quick-release sling to enable simple lifting on board the FBOP by davit	a) Check lifting points in number check strengthening record position and also test its functionality,

S/N O		Proposed QRs/Technical Specification	Trial Directive/ Procedure suggested for trial for Board of Officers
		or by crane in other cases. Supplier shall ensure that normal deck cleats of stainless steel marine grade SS 316 or superior are provided, as well as two stainless steel towing lugs. Lifting of the FPB shall be with the existing boat davit fitted on FBOP. The Center of Gravity of boat/lifting center shall match with boat davit hook center. The supplier shall provide cradle for the stowage of boats.	<ul> <li>(Lowering &amp; Hoisting tests to be carried out as per class approved plan.</li> <li>b) Load test certificate to be provided by builder.</li> </ul>
24.	Boat equipment	<ul> <li>a) Galvanized Grapnel anchor as per class approved with 19mm PP rope having 50 mtr length with sufficient breaking strength.</li> <li>b) Boat hook having 8' length of teak wood with Galvanized hook at the end.</li> <li>c) Oars 02 Nos with rowing lock.</li> <li>d) Pneumatic fender 04 Nos.</li> <li>e) Mooring lines 20 Mtr length, size 16mm PP rope of sufficient strength-02 Nos</li> <li>f) Mooring line 30 mtr length, size 12mm PP rope of sufficient strength-02 Nos</li> <li>g) VIP flag post brass detachable -01 Nos</li> <li>h) Hard bamboo 1.5 inch x 09 feet length. 02 Nos</li> </ul>	a) Check anchor & other equipment's as per class requirements.
25.	On board spares	Supplier will provide on board spares required for 600 hours run operation of the OBM as per OEM recommendations. List of on board spares to be furnished by the supplier in the tender documents.	Check quantity and record inventory
26.	Bilging arrangemen t	Hand operated and electrical bilge pumps be provide as per class requirement	Check by operating its functional by drawing out water from bilge.
27.	Bollard and cleats	(Properly strengthened according to the class notation requirement) Bollards- 03 Nos, 01 Fwd and 02 Aft Cleats- 04 Nos, 02 Fwd & 02 Aft	<ul> <li>i) Check bollards in number and load for length/thickness.</li> <li>ii) Check load &amp; material tes certificate is to be submitted by builder.</li> </ul>
28.	Fitting & fixture	All fitting & fixtures including nut, bolt, screw etc shall be of SS-316 grade unless other materials are suitable for a particulars application as per BIS standards.	Material test certificate to be submitted by builder from accredited lab.
29.	Materials	<ul> <li>a) Vinyl ester resin should be used for construction of hull should be approved by IRS/any other member of the international Association of Classification Society (IACS)</li> <li>b) Glass Reinforced Plastic materials used in construction such as Chopped Standard Mat, Woven Roving etc. shall be IRS/IACS member approved.</li> <li>c) Core materials approved by IRS/IACS member.</li> <li>d) All SS Material used in the Deck or any other places should be</li> </ul>	<ul> <li>A, b &amp; c) check material used certificate issued by class society.</li> <li>d) Check test report of SS items. It should be SS-316.</li> <li>e) Check material and certificate.</li> <li>f) Certificate be obtained from class.</li> </ul>

S/N	Sector States	Proposed QRs/Technical Specification	Trial Directive/ Procedure
0			suggested for trial for Board of Officers
		Marine Grade of SS 316. e) Toughened Glass Wind screen-approved type to be provided wherever necessary in front & side of Helm man & Co-driver seat. f) The quality of materials should be ensured/certified by classification society at every stage of construction. g) Required rain water drain plug in the boat to flush out rain water from the boat.	
30.	Certificate	<ul> <li>The following certificate and documents shall be supplied at the time of delivery of the vessel:-</li> <li>a) Classification Certificate as the construction of boat according to the class notation mentioned at Srl No. 2 above issued by Classification Society Rules.</li> <li>b) GA drawing along with other plans approved by class.</li> <li>c) Load test certificate of four point lifting arrangement.</li> <li>d) The certificate of materials used in construction of boat by Classification Society.</li> </ul>	Check the all required certificate/ approved drawing provided by builder duly approved by class society.
31.	Classificatio n Regulations & Marks on Hull, Super structure Colour Scheme	<ul> <li>Classification Regulations.</li> <li>FPB shall be designed, built and outfitted to comply with all the applicable provisions and requirements of the current International Rules and Regulations of Classification Society State approved Statutory authority.</li> <li>Marks on Hull, Superstructure</li> <li>The Boat name, ID Nos, user emblem, National Flag is to be affixed to both sides of the hull at super structure level. Size and location to be as approved by purchaser.</li> <li>Colour Scheme: The outer skin of the fiberglass hull is to be gel coated with white colour glossy finish. To protect the surface of the boat, sealing the fiberglass beneath from the elements including water moisture and the sun's ultraviolet rays.</li> </ul>	Craft ID No, BSF emblem etc to be physically checked.
32.	Cathodic Protection External	<b>Anodes:</b> Suitable anodes to be fitted at appropriate places wherever required (OBM) for 18 months of continuous service.	Check anodes for locations.
33.	Tools	One set of tools specified by the OEM for routine maintenance etc. 01 No. propeller removing tool kit. 01 No. hand oil drain pump. 01 No. special tool for removing/fixing of oil filter to be provided. 01 No. spark plug spanner 01 Nos pliers 01 Nos adjustable spanner	Check physically

<b>S/N</b> o 34.		Proposed QRs/Technical Specification	Trial Directive/ Procedure suggested for trial for Board of Officers
	Canapy	A stowable canopy parachute canvas loth/acrylic canvas loth may be fitted. The stainless steel collapsible canopy frame folds aft and stows above the transom. Canopy should be able to withstand high relative winds of upto 60 knots (30 knots wind + 30 knots speed)	Check physically Check canopy during speed trial against true wind.
35.	First aid box	Suitable first aid box and provisioning for keep it.	Check physically.
36.	Document	Fast patrol should be supplied with documentations/drawings, fitted equipment details and Boat data book.	Check all records.

तकनीकी विशेषज्ञों के उप समूह द्वारा यह निश्चित किया गया है कि उक्त गुणातमक आवश्यकता को अधिक बेहतर बनाने के लिए गृह मंत्रालय एवं सीमा सुरक्षा बल की वैबसाईट पर विकेताओं/फर्मों के सुझाव प्राप्त करने हेतु 15 दिनों के लिए अपलोड किया जाए।

नोट – सभी विकताओं / फर्मों से निवेदन है कि अपने सुझावों के साथ निम्नलिखित कागजात संल्गन कर ई–मेल पता comdtord@bsf.nic.in पर भेजने का श्रम करें:-

- 1. उत्पाद की वास्तविक विवरण पुस्तिका।
- 2. उत्पाद की साहित्यिक रचना का ब्यौरा।
- 3. गुणातमक आवश्यकताओं के उपर व्यापक टिप्पणीयाँ।

(दिगेन्द्र) सिंह पॅवार) उप कमांडेण्ट (आधुनिकीकरण)

	QUALITATIVE REQUIREMENTS & TRIAL DIRECTIVE OF MECHANIZED BOAT					
S/No		Proposed QRs/Technical Specification	Trial Directive/ Procedure suggested for trial for Board of Officers			
01	Functions	<ul> <li>The boat shall be designed to carry out day/night coastal patrol and surveillance operation in, Creeks of Gujarat. The boat shall be highly sea worthy. The boat shall have propulsion, power generation, lifesaving protection and other engineering and electrical systems to carry out safe and reliable operation to perform the following functions.</li> <li>(a) Patrol in shallow coastal waters in day and night.</li> <li>(b) To carry out coordinated and secure operations with Force Protection Vessels and other crafts/boats deployed.</li> <li>(c) Seaward anti-terrorist patrols for security of coastal installations own vessels and own coast.</li> <li>(d) Search and rescue.</li> </ul>	Check the navigational system for night ops. Trial be carried out in shallow during day and night.			
02	Class	MB should confirm to IRS or any other member of IACS class notation SWASTIK, SUL, HSLC, RS-2, Patrol, SWASTIK IY or equivalent patrol boat for operation within 20 nautical mile from coast having sea condition such that the design significant wave height not exceeding 2.5 M. Boat should have hard chine shape planning hull with optimum dead rise angle to meet the desired speed and stability requirement.	Check the criteria with classification society representative. Examine the class certificate issued by classification society with the specified class notation for compliance.			
03	General Features	<ul> <li>a) The Mechanized boat should be capable of operating in shallow waters in minimum depth of 5 feet in extreme tropical conditions.</li> <li>(b) Should be capable of operating in shallow waters.</li> <li>c) The MB should have a service life of 15 years for machinery equipment and hull of the boat. The MB should be able to have sustained operation of 4-6 hrs per day with annual exploitation not less than 2000 hrs.</li> <li>d) Excellent directional stability and good sea keeping hull characteristics.</li> <li>e) Regime of Operation:- Machinery installation should be such that undesirable vibrations, noise etc are minimized and measured parameters during trial shall conform to class Rules. Should have high operational availability and system redundancy.</li> <li>(f) Should be capable of mission periods of 24 hours with 16 hours run at average cruising speed with full load.</li> <li>g) The automation features and functional aspects in machinery Operations are to be provided considering the indicated crew. Details of machinery controls and automation are to be indicated.</li> <li>h) All round fendering (vertically placed) on crafts side.</li> <li>i ) Should have Armour Protection to wheelhouse/control cabin including Bullet proof glass and open able window for cross ventilation. Ballistic test as per approved procedure and schedule to meet NIJ-111/EN 1063 standard.</li> <li>j) The MB should be fully compliant with MARPOL Regulations in force, built to classification society norms and SOLAS compliant in respect of boat safety as applicable.</li> <li>k) Latest design concepts for boats, with respect to ergonomics and crew comfort are to be included.</li> <li>i) The boat should have class approved fire fighting appliances, life saving appliances and other required accessories.</li> <li>m) As the boat has to run in costal water so GMDSS certificate required and also</li> </ul>	Check the criteria with classification society representative and check physically the fender and other items as per class requirement. Check fuel tank size. It should be sufficient for 24 hours operations. Examine certificate issued by classification society for compliance to SOLAS requirement and safety plan as per class rules. Ballistic test carried out to check the quality to the prototype boat. Check certificate etc.			

S/No		Proposed QRs/Technical Specification			Trial Directive/ Procedure suggested for trial for Board of Officers
	required fitments of AIS. n) 03 Nos. 9 cm size Port hole (it should be covered with round disk of bullet resistant material) on Port & STBD at suitable place be provided to fire the weapon from inside the cabin.o) All SS materials should be Marine grade SS-316.				
04	Operating				Check as per requirement.
	Profile	S/No Speed of Mechanized hoat in knots	No of Hours	Operating Time	
	Tionic	a From 20 knots unto 25 knots	200 Hrs	10% of annual exploitation	
		b From 15 knots upto 20 knots	800 Hrs	40% of annual exploitation	
		C From 10 knots upto 20 knots	600 Hrs	30% of annual exploitation	
		d From 7 knots upto 10 knots	400 Hrs.	20% of annual exploitation	
05	Supervision during Construction	As the vessels are being built to class, these Society. The Owner reserves the right to directly or by third party. Boat builders wou facilities at yard premises to the inspecting tea be conducted for ascertaining work progress from user end.	Check as per requirement		
06	Life Time Support	The Shipyard is to obtain a Contractual commitment from the various equipment suppliers to provide Product Support for a minimum period of 10 years including electronics, after delivery of the last MB. In case the equipment is likely to become obsolete, the manufacturer of boat should be committed to give a clear three year nation to the BSE.			Product support records to be checked.
07	General instruction	Preliminary stability calculation, power, resistance & endurance calculations General arrangements plan of boat along with lay out of major machinery / equipment's & system duly vetted by Classification Society are to be submitted along with technical offer. Also, the offer design shall be proven design and in case of new design model test report of the design is to be submitted by the builder alongwith technical offer.			Check record physically.
08	Length	Length hull overall -13m + 0.5 MtrBeam overall -4m + 0.5 Mtr	tr		Check with measuring tape in clam water and tally with approved drawing.
					Check lines plan and general arrangement drawings.
09	Draught	Not exceeding 1.0 mtr at full load			Check draft marking made by builder on full load. It must be below 1.0 Mtr
10	Displacemen t and weight	As per given endurance, loading and speed requirement. Weight As per design of the Boat.			Check classification society approved stability booklet.
11	Propulsion	<ul> <li>a) Two inboard turbo charged water cooled class approved marine diesel engines driving suitable propeller through shafting &amp; reverse/reduction Gear Box (marine class approved) for low draft operation.</li> <li>b) Electronic control and monitoring system for engine, gear box and propulsion system.</li> <li>c) Easy electrical starting system of Main Engines by battery.</li> </ul>		Check its functionality as per specifications recommendation of OEM in presence of class society representative.	

S/No		Proposed QRs/Technical Specification	Trial Directive/ Procedure suggested for trial for Board of Officers
		<ul> <li>d) Remote starting/ stopping of main engines from the wheel house and locally from engine room.</li> <li>e) Silencer for main engine exhaust system should be catered for.</li> </ul>	
12	Fendering	Boat shall have heavy duty 'D' shape rubber fender all along the boat. 04 Nos. portable pneumatic fenders size (Length -2.5' x Width-1').	Check fender for adequacy/ location. Check class approvals certificate for materials.
13	Fresh water capacity	600 ltrs	Check tank, empty the tank. Fill tank with measured volume of 600 ltrs
14	Maximum speed	25 knots at full load correspondence to 85% MCR of the engine rating at sea state 2 conditions.	To be physically checked in sea state-2 with GPS during sea trials with and against tide/current & by calculating the distance travelled & time taken.
15	Cruising Speed	20 Knots at full load	To be checked during speed trial.
16	Endurance	a) Endurance is 16 hours at full load in cruising speed of 20 knots.	Trial to be carried out for 3 hrs@ 20 knots with full load (man & materials with eqpts) during sea trial (favour & against the current ) distance travelled & fuel consumed to be recorded. Check & calculate fuel tank capacity meets endurance requirements
17	Floor	As per class approved, should be Anti-skid floor/ deck.	To be physically check for antiskid flooring as per class approved drawing.
18	Seaworthine ss	The craft shall be capable of maintaining 15 knots speed without impairing crew or craft performance in sea conditions up to sea state-3 and survivability up to sea state 4.	<ul><li>(a) To be checked during speed trial.</li><li>(b) Boat builder to provide class approved certificate.</li></ul>
19	Complement	Mechanized Boat shall have a capacity of 12 people on board including Crew. The boat shall be fitted with twin engine of sufficient horse power to generate desirable speed and endurance.	Seating capacity & sleeping arrangement to be physically checked.
20	Environment al conditions	<ul> <li>The equipment and the machinery fitted on the MB should be marinised and capable of satisfactory operation, under the following environmental conditions:-</li> <li>a) Wind speed up to 30 knots</li> <li>b) Ambient air temperature from zero to +50 C.</li> <li>c) Water temperature from 01 C to 40 C.</li> <li>d) Max relative humidity of 90% at 32 C.</li> <li>e) Salinity of water up to 36 PPM.</li> </ul>	Assess environmental condition. Check class approved for all environmental condition.
21	Standard	<ul> <li>a) The crafts shall be designed and constructed as per IRS class notation or any other member of IACS. Main engines, gear boxes and generators are to be type approved by IRS or any other member of IACS.</li> <li>b) The craft shall be fully compliant with MARPOL and SOLAS regulations as applicable . Material for pipes, valves, pumps etc. shall be in accordance with class specifications/marine grade.</li> <li>c) All underwater fitting, pipes cables, bilge pumps etc are to be class approved type for marine intended applications.</li> <li>d)The boat shall be having a GRP/FRP planning hull. Hull, deck and wheel house</li> </ul>	<ul> <li>a) Class type approved certificate to be provided by the boat builder.</li> <li>b) Check class approval certificate and to be checked physically.</li> <li>c) To be checked physically.</li> <li>d) Check material used certificate issued by class society/accredited lab.</li> <li>e) Check test certificate.</li> <li>f) Check physically in presence of rep of</li> </ul>

S/No	- Carlos	Proposed QRs/Technical Specification	Trial Directive/ Procedure suggested for trial for Board of Officers	
		<ul> <li>shall be constructed using IRS approved composite materials i.e High quality marine grade Gel coats, vinyl ester resins &amp; Reinforcements.</li> <li>e) The reinforcements like non crimp fabric, core materials (PVC/PU Foam), and glass fabrics shall be used.</li> <li>(f) Good intact and Damage stability, damage survivability, watertight integrity and crew/equipment protection.</li> <li>g) The upper side deck layout/fitting, crafts-side and interior arrangements shall facilitate easy boarding operations and keep crew fatigue within acceptable parameters.</li> <li>h) The boat shall be designed to cater clear uncluttered areas and well laid out deck for ease of operation and movement.</li> <li>i) The Hull below water line shall be painted with the Tin free Anti fouling paint system as per the latest IMO regulations international paint scheme (for 5 years).</li> <li>j) The construction shall be done in controlled temperatures/humidity to gain the best laminate properties.</li> <li>k) All SS Material used in the Deck or any other of marine Grade of SS 316. All the materials, workmanship and finish shall be of the highest standard/quality and as per class requirement.</li> <li>l) All wood should be 100% water proof.</li> <li>m)All ply wood should be 100% water proof marine ply wood. All wood fittings should be high quality seasoned teak wood.</li> <li>n) In the engine room final coat shall be of approved fire retardant resin.</li> <li>o) All workmanship and finishing of boat will be entire satisfaction of the owner.</li> </ul>	<ul> <li>trial for Board of Officers</li> <li>classification society. Stability booklet o each Boat shall be approved by class society</li> <li>g) Check physically.</li> <li>h) To be checked physically</li> <li>i) Check the certificate</li> <li>j) Classification certificate to be checked.</li> <li>k) Check test report of SS items. It should be SS-316.</li> <li>l) Check certificate for bullet proof property m) Check material test certificate.</li> <li>n) Check physically</li> <li>o) Check physically.</li> <li>p) Check relevant documents</li> </ul>	
22	Hull	<ul> <li>p) Any involvement of marine regulation other than specified in the QRs which is required to be considered for the quality/required parameters while approving of design/constructing of the boat, stage wise/items wise may be ensured by the builder to get it approved by Classification Society.</li> <li>a) The hull shall be constructed in accordance with classification society rules and shall be of single piece FRP mould with smooth mat finish scratch proof Gel Coat outer finish in single mould.</li> </ul>	a) Check the hull physically in presence of IRS rep. It should be as per class society recommendation.	
		<ul> <li>b) Order deck includes longitudinal and transverse stimeners and sub division bulkheads, with anti-flooding and damage control as per class requirements.</li> <li>c) To have minimum draught for easy beaching and sail in shallow water. Bottom should be strengthened for this purpose.</li> <li>d) The hull should be strengthen to resist the slamming effect of the water waves as per the sea state specified in QRs.</li> </ul>	<ul> <li>b) Certificate to this effect be obtained from the builder.</li> <li>c) Check draft certificate also physically.</li> <li>d) Check in presence of rep of Classification Society.</li> <li>e) Check protection for propeller.</li> </ul>	
23	Main Diesel Engine	The MB should be fitted with suitably rated class approved twin inboard diesel engines(one per shaft) directly coupled to class approved reversible reduction gearboxes driving suitable propulsion system meeting the speed requirement. The propulsion package should cater for shallow water operations. The propulsion system should be designed to achieve desired performance throughout the life of the boat(15 years) The following requirements for main diesel engine are to be ensured:- a) The main diesel engine power should be suitably rated so as to achieve a maximum speed of not less than 25 knots and reliable operation as per the operating profile of the vessel over the service life of the vessel. b) Operation of the engine in the specified operating profile and duty should be	<ul> <li>Type approved certificate to be provided by the boat builder alongwihg Unit Certification of each main engine</li> <li>Prepare main engine for operation.</li> <li>Engine performance trial to be conducted by running on various RPMs for one hour continuously. All parameters of engine must be in normal limits specified by the engine manufacturers. This trial will be done twice after interval of half hour.</li> </ul>	

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		<ul> <li>validated by the engine OEM and all warranties for the engine as provided by the OEM should hold good for all exploitation regimes. Confirmation from OEM with respect to the same is to be provided by the Builder in their technical offer.</li> <li>c) Remote starting/stopping of main engine from wheel house and locally from engine.</li> <li>d) In order to ensure independent availability of propulsion system, the Main-Engine driven sea water pump shall supply cooling water requirements of the entire propulsion train (including the gearbox)</li> </ul>	<ul> <li>Start port main engine. Stop as soon as LO pressure are achieved.</li> <li>Repeat – Start – Stop 10 times.</li> <li>Carry out same for STBD side main engine also. No. of starts given:- Port – 10 starts, STBD – 10 starts</li> <li>Attempts Time in (Sec)</li> </ul>	
		<ul> <li>e) The main diesel engine should be type approved and MARPOL latest applicable standard compliant. Engine should have mechanical fuel pump with facility to control electronically (This clause included to run the engine in case of electronic control system failure).</li> <li>f) Tubes of all cooling water heat exchangers external to the engine should be of 70:30 Cu-Ni suitable for operation in a corrosive extreme tropical marine environment. Zinc Protectors shall be provided in end covers.</li> </ul>	ME (P)         ME (S)         DG Set           1	
			5         6           7         8           9         9	
		g) The main diesel engine is to be electrically started through batteries. Redundancy is to be provided in the form of at least two independent battery sources that can be cross connected to start either engine.		
		<ul> <li>h) All electronic components, controls and wiring used on the engine and the Boat are to be marine version complying with IP 65 rating.</li> <li>i) Maintenance and supportability to be ensured anywhere in India through OEM authorized Indian reps.</li> </ul>	Note:- specific gravity of batteries to be checked before and after endurance trial. - Check Engine start/stop and check battery provided meets the rated output. Record	
		<ul> <li>j) Sufficient ventilation blowers are to be provided in the engine room suction at front of engine room delivery from back side of engine room to ensure that the maximum rise of air temperature not more than 13° C above ambient in enclosed mode</li> <li>k) Sea water cooling pump shall be made brass body &amp; brass impeller (rubber impeller will not sustain the operation in the area of employment).</li> </ul>	specific gravity batteries before/after engine start. OEM should provide brass material certificate.	
24	Reduction Gear Box	<ul> <li>a) The reduction gearbox should be marinised and built to classification standards and rigidly mounted. The gearbox should be reversible. Thrust bearings are to be incorporated within the gearbox. The gearbox is to be complete with its auxiliary equipment, systems, controls and instrumentation. The gearbox operating profile is to match the engine operating profile.</li> <li>b) Operation of the gearbox OEM and all warranties for the gearbox as provided by the OEM should hold good for all exploitation regimes. Confirmation from OEM with respect to the same is to be provided by the Builder in their technical offer.</li> <li>c) Facility for lubrication of the gearbox is to be provided in case the shaft is required to be trailed for a prolonged duration. Arrangement for locking the shaft is also to be catered for.</li> </ul>	<ul> <li>a) Type approved certificate to be provided by the boat builder along with Unit Certification of each GB.</li> <li>(b) Gear Box performance trial to be conducted by running on various RPMs for one hour continuously. All parameters of engine must be in normal limits specified by OEMs. This trial will be done twice after interval of half hour.</li> <li>c) Speed achieved during various RPM be recorded.</li> </ul>	
25	Power	<ul> <li>a) Both of the following standard power supplies (as appropriate) are to be used on the craft:- <ul> <li>(i) 230 V 50 HZ 1ph. (ii) 24V DC.</li> </ul> </li> <li>b) The boat shall be fitted with 02 Nos portable 230V, 1 Phase AC 50Hz marine Diesel Generator including AC plant (01 for standby) having sufficient capacity to cater for the entire electrical equipment and with a minimum 10% growth margin. The generator shall have its controls and indicator gauges near the generator and remote position at</li> </ul>	<ul><li>(a) Full power trials of boat at 100% MCR and to be conducted for one hour with recording of all system parameters.</li><li>(b) Class type approved certificate to be provided by the boat builder.</li></ul>	
		Coxswain's post. The gen set shall be fitted with silencer to reduce the noise.	(c) DG Set performance trial to be conducted by running for one hour continuously on full	

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		c) A emergency battery backup system to cater for uninterrupted power supply, for a minimum duration of 06 hrs to essential equipment viz. controls, navigation, communication, lighting and domestic equipment is to be provided. A load analysis chart justifying the capacities of the power supply source and a single line schematic diagram showing arrangement of the power generation and distribution is to be provided along with the technical offer for both generator and UPS.	load. All parameters of DG Set must be in normal limits specified by the DG Se manufacturers. This trial will be done twice after interval of half hour.
26	Electric system	All the electrical equipment, cables and fittings, machinery and associated systems shall be of IP 57 and above proven design and shall conform to Classification rules. All electrical equipment, cables and fittings shall be of proven design, reputed make and conforming to classification society rules. Classification Society test certificates shall be submitted for Generators/ Battery banks and Main Switch Board (instrumentation and switch gear). Sockets are to be provided at appropriate locations for 12/24V DC and 230V AC.	Functioning of all electrical fitments to be checked during functional trials.
27	Supply system	Emergency Lighting/Emergency lighting fittings etc supplied from 24 Volts DC distribution board shall be fitted to provide illumination to access ways, passage ways, in compartments and as approved by Class rules.	To be physically checked.
28	Shore supply arrangeme nt	A waterproof shore supply connection box 230 V, 1 phase, 50 Hz alongwith 50 Mtr shore cable shall be fitted on weather deck at an appropriate position conforming to Classification rules, to meet the requirements of the harbour loads. In case, the main supply of 24V DC, provision for suitable conversion of the shore supply to 24V DC needs to be catered for. A reel for stowing the flexible cable will be provided and suitably located on the winch deck	To be checked during functional trial.
29	Batteries	Adequate number of 12 V DC Lead Acid maintenance free Gel type batteries sourced from reputed firms are to be provided to cater for 24 V battery back system and for starting of DG/ main engine as applicable. Batteries are to be located in well ventilated space and will be housed in suitable FRP/hard wood boxes with internal lead lining. Suitable battery charging arrangement for charging of batteries from the boat generator as well as from 230V, 50 Hz shore supply	Specific gravity of batteries to be recorded. To be physically checked.
30	Motor	All motor shall be confirmed to classification rules suitable for marine use. Sitting of motors should be as per classification society's regulations. Type of enclosure protection for motors at weather deck should be IP 56 and below deck can be IP 55.	Load trial be carried out during functional trials.
31	Cables	<ul> <li>a) Electrical Cables conforming to Class requirements shall be used. LFH cables conforming to marine specifications shall be used in main switch board, control panels etc.</li> <li>b) Each and every cable shall be affixed with indelible brass identification tallies at each end before entering equipment. The tally shall indicate circuit code number as shown on relevant Drawings.</li> </ul>	Type approved certificate of cable to be provided.
32	Search Light	Two high definition, high beam, marinised Search lights for 360 degree having detection range 500 meter, identification range 400 meter and recognisation 300 meter.	Check functioning of search light manually and remote operations.

<b>S/No</b> 33		Proposed QRs/Technical Specification	Trial Directive/ Procedure suggested for trial for Board of Officers	
	Fuel Tanks and Fuel System	<ul> <li>Fuel tanks and fuel system is to cater for the following:-</li> <li>a) Separate fuel tanks for each main engine are to be provided. The tanks are to be located at appropriate place as per design and are to be interconnected.</li> <li>b) The fuel tanks should be of marine grade Aluminum or S.S with EPI Coat with baffles to reduce sloshing .The tanks are to have suitable inspection manhole, filling point on deck, drainage valve and suction lines with valves for each engine with water separator and filters.</li> <li>c) Fuel capacity to be designed in consonance with the type of engines and as per endurance criteria with 25% reserve.</li> <li>d) "Digital tank level indicators" are to be provided for the fuel tanks. The fuel state indication is to be provided on the bridge/wheel house control panel also visual fuel level indicator provided in each tank.</li> <li>e) The vent pipes shall terminate in atmosphere and be positioned with a NRV to avoid ingress of rain water or spray.</li> </ul>	Check fuel capacity .Tank capacity to meet endurance requirement	
34	Armament	<b>Location for Main and Secondary Armament</b> Gun mounting for LMG /MMG alongwith NIJ level-3 protection to be provided in such a way as to facilitate all-round i.e. 360 degree fire power viz on bridge top. 270 degree ±20 <sup>0</sup> forward and aft deck. <b>Armament Locker</b> The armament locker shall be provided in conformance to the QR's and shall have the capacity of storing ammunition. Essential safety features and flame retardant paint shall be provided in armament locker.	Check mounting of weapons. Check stowage area adequacy. Builder to submit weight calculations with BP panels fitted and prepare preliminary intact stability booklet for Class approval.	
35	Fire Fighting and Damage Control- Approved Type and Portable Fire Fighting Appliances.	The boat shall be equipped with fire pump synchronized bilge pump facilities from sea chest, fire line, fire hydrant, automatic emergency lighting and automatic fire fighting arrangements along with fire hose and fire nozzle to be provided as per class requirements. Portable damage control equipment such as plugs, wedges, etc to be provided. Adequate portable fire extinguishers to meet the requirement of Classification Society rules are to be provided. The portable firefighting appliances shall be supplied and distributed throughout the boat. Suitable brackets/clamps shall be provided for securing them.	Arrangement of Fire Firghting Equipment, their operation to be checked physically as per Class approved drawing.	
36	Life Saving Appliances - Approved Type	<b>Type</b> Lifesaving appliances will be in accordance with SOLAS/Class requirements. 06 Hazardous Duty Life Jackets–As per technical specifications enclosed as <b>Annexure- I to QRs.</b> 14 life Jackets SOLAS approved 04 life Buoys SOLAS approved with proper hanging/stowage arrangement on outer deck along with 30 Mtrs life lines. 02 Nos 08 men capacity life raft to be provided (Port and Starboard side). All seats and gun mounts to be provided with safety harness and hand hold throughout the boat.	<ul> <li>i) Lay out the buoys/jackets count and record.</li> <li>(ii) Check stowage area.</li> <li>(iii) Check class approved certificates.</li> <li>(iv) Random testing of kit be done to ensure unctionality.</li> <li>(v) Check class approved certificate and expiry date of life raft.</li> </ul>	

S/No	10-12-213	Proposed QRs/Technical Specification	Trial Directive/ Procedure suggested for trial for Board of Officers
37	Vibration, Shock and Noise	<ul> <li>(i) Hull Vibrations. The vessel and all equipment should be free from excessive vibrations.</li> <li>(ii) Propulsor Induced Vibrations. Special care should be taken for the design of the package to minimize propulsion induced hull vibrations. Torsional and lateral / axial vibration calculations for the propulsion system shall be made in the design stage to demonstrate the acceptability of vibration levels. Maximum vibration for main equipment is not to exceed levels stipulated vide ISO – 10816 and ISO standard 6954 guidelines for permissible vibration, workmanship and installation of all machinery and associated equipment shall be such that the noise levels and sound frequencies will permit normal conversation at all operating positions under all conditions. Every practical effort is to be made to minimize the equipment noise by use of vibration mounts below all machinery.</li> </ul>	To be checked while sea trial.
38	Towing Equipment' s	Suitable towing arrangement, to tow a disabled boat of equal size, to be provided as per classification society approval.	To be physically checked. Load Test Certificate of tow hook/arrangement is to be provided.
39	Lifting and towing Arrangeme nts	It should have suitable lifting arrangement for being hoisted on the jetty. Support plan, indicating the main underwater projections are to be prepared and sent to Owner for reference. The lifting arrangement is to be load tested as per Class. A cradle for undertaking maintenance/stowage during monsoons is to be provided. Tools (including special tools) and arrangements for lifting and shifting of heavy machinery including engines, gearboxes etc. are to be provided for carrying out periodic maintenance routines as specified by the equipment OEMs.	Check lifting points in number & location. Check strengthening record position. Load Test Certificate to be provided by builder.
40	Ropes	Poly propylene (PP) ropes of following length and thickness to be provided for berthing,towing, mooring, and anchoring the boat.a) For berthing- 12 mm dia- 100 metersb) For towing- 18 mm dia- 50 meters.c) For mooring- 12 mm dia- 100 metersd) For anchoring- 18 mm dia- 100 meters- 100 meters- 100 meters- 100 meters	To be physically checked. Materials test certificate to be provided by builder.
41	Weather Covers	Two sets of lightweight Canvas Covers are to be supplied for all weather deck machinery and accessories.	To be physically checked
42	Window Wipers	All front windows be provided heavy duty wipers (Class approved, marine grade).	To be physically checked & functioning to be tested.
43	Accommoda tion and Habitability	<ul> <li>Ventilation : Wheel house/Accommodation spaces are to be air conditioned as per Class requirements. Adequate forced /cross ventilation is to be provided in the machinery spaces as per Class.</li> <li>Wheel house : A seating arrangement for eight personnel is to be provided in wheel house. This enclosed area is to be provided laminated troughed glass and have all round clear vision. The seating arrangement, cupboards and stowage design are to be of contemporary design. Steering console shall be equipped with equipment's as per machinery specifications. A stainless steel mast to carry various navigational lights and flags as per practice shall be provided on top of the wheel house. Arrangements</li> </ul>	To be physically checked To be checked physically as per approved drawing plan. Functional test of all equipment to be carried out & recorded.

S/No	Proposed QRs/Technical Specification		Trial Directive/ Procedure suggested for	
		<ul> <li>for DCP &amp; mechanical foam type fire extinguisher to be provided. A bulkhead mounted electric fan along with two portable chairs and a bulkhead mounted hinged table top to be provided. Space should also be provided for keeping VHF sets and battery next to the coxswain's chair and seating arrangement for capacity of 08 persons. All Furniture shall be of modular Design. The layout of accommodation space, Bathrooms and WC should be modern and ergonomically designed to facilitate comfort and utility. Any additional items contributing to comfort may be incorporated with Owner's approval. Four personnel sleeping arrangement in fore cabin to be provided.</li> <li>a) All equipments, accessories etc should have securing arrangements for rough weather condition.</li> <li>b) Night lighting arrangements (Red lights) to be provided.</li> <li>c) 04 Nos wall fan and open able window for cross ventilation in case of AC shut down</li> </ul>	Check securing arrangements Check night lighting arrangements.	
44	Sanitary	Suitable sanitary system, including washbasin, toilet with a holding tank/ flushing out arrangement is to be provided. WCs are to be provided with integral macerating/treatment unit with provision to discharge overboard or to shore collection unit	To be physically checked as per approved drawing.	
45	Forepeak	Fore peak shall be built for stowage of anchor chain cable and other ropes. A Naval pipe of stainless steel shall be fitted in the compartment for anchor chain cable. Arrangement for securing the inboard end of the chain cable shall be provided in the compartment. A drainage arrangement shall be provided as per class requirements.	Check stowage area for anchor and anchor chain/cable, check drainage arrangement.	
46	Fore cabin	This compartment shall provide convenient sleeping arrangement for a minimum of 04 persons with mattress, blankets, bed sheets and pillows. Adequate electrical light and fan fitting along with suitable blower system and 02 Nos hatches may be installed for proper ventilation. Locking cupboards shall be provided. Extra storage facilities shall be provided under the bunks. Rack for accommodating 10 Nos Rifles and 2 Nos LMG along with ammunition.	To be physically checked as per approved drawing.	
47	Instrumentati on Panel	<ul> <li>Machinery space is to be provided with suitable acoustic insulation.</li> <li>A suitable monitoring and control system for the main engines and gear box is to be provided in the helms console. The engines and gearbox will be controlled form the helms console. The control station in the helms console should have provision for starting , stopping, monitoring control and operation of main and auxiliary machinery. All instrumentation panels are to be watertight. All gauges are to be provided with integrated lighting with dimmer facility. Essential machinery instrumentation shall include the following (list is indicative and shall be enhanced as per OEM recommendations): <ul> <li>a) Engine Tachometer</li> <li>b) Engine oil pressure gauge</li> <li>c) Engine cooling water temperature gauge</li> <li>d) Engine oil temperature gauge</li> <li>e) Gear box oil pressure and oil temperature gauge.</li> <li>f) Speedometer</li> <li>g) Single lever engine/gear box control system.</li> </ul> </li> </ul>	To be physically checked. All parameter to be recorded for correctness during performance/functional trials.	

S/No		Proposed QRs/Technical Specification	Trial Directive/ Procedure suggested for trial for Board of Officers
		<ul> <li>h) Rudder angle indicator.</li> <li>i) Light indicator</li> <li>j) Magnetic compass.</li> <li>k) Engine oil pressure alarm</li> <li>l) Engine oil pressure trip</li> <li>m) Engine oil temperature alarm</li> <li>n) Engine water temperature trip</li> <li>o) Gearbox oil pressure alarm</li> <li>p) Gearbox oil pressure trip</li> <li>q) Gearbox oil temperature alarm</li> <li>r) Emergency main engine stop</li> <li>s) Over speed trip mechanism and indication</li> <li>t) Hour counter</li> <li>u) Ammeters/voltmeters for monitoring battery charging/battery voltage/load current</li> <li>v) Exhaust temperature gauges</li> </ul>	
48	Navigational equipment. Approved Type	a)Magnetic compass	Check the liquid magnetic compass as pe OEM specification. Check its functionality. Check accuracy with the belo of GPS
		b) Echo Sounder	Check functioning of equipment and type approval certificate.
		c) DGPS.	Check functioning of GPS and type approval certificate.
		d) Navigation light should be accordance with IRPCS rating	Check the class certificate & check the functionality of navigation light on deck physically by switching ON and OFF 10 to 15 times. Check arc of navigation light.
		e) Horn should be accordance with IRPCS rating.	Check the functionality of horn on deck physically by switch ON and OFF 15 times.
		f) Two high definition, high beam, marinised Search lights for 360 degree having detection range 500 meter, identification range 400 meter and recognisation 300 meter.	Check functioning of search light manually and remote operations.
		g) Anemometer	Check functioning and type approval certificate.
		h) Wet and Dry bulb thermometer	Check functioning and type approval certificate.
		i) Barometer	Check the barometer as per OEM specification. Check its functionality and the accuracy and type approval certificate.

S/No	A starting the second	Proposed QRs/Technical Specification	Trial Directive/ Procedure suggested for trial for Board of Officers
77.494-2 	an durant shinesin	j) Chart table & locker with parallel-ruler, dividers.	Check the power supply from boat within the rated range. Physically check its functionality on the boat and type approval certificate.
		k) Loud hailer (50W) with PA facility.	Check functionality of Siren by switching ON & Off 10 to 15 times.
		I) Police light/siren	Check the equipment, OEM manual and instructions.
	-	m)Window Wiper/Clear View screen	Check its functionality
		n) Binoculars -02 No (one for day light and one with night vision capability)	Check physically.
		o) AIS should be provided.	Check class certificate of the equipments.
49.	Rudder and Steering arrangement s	The rudder and steering arrangements shall be hydraulically operated and the arrangements shall be capable of operating the boat in water depths of more than one meter with good maneuverability at low speeds. The arrangements shall be sensitive and provide fine control on speed specially in confine spaces. The stainless steel stocks shall be mechanically operated from the coxswain position with the provision of hand tiller for emergency local operation also a rudder angle indicator shall be fitted.	Check its functionality as per recommendation of OEM in presence of classification society representative. Boat builder should provide type approved certificate.
50	Steering	Hydraulic steering operated from wheelhouse helms/command console	
51	Deck	Deck shall be constructed with GRP laminates as per classification society Rules. All the exposed surfaces of the main deck shall be given antiskid finish .Additional chaffing laminate shall be provided in way of anchor arrangements.	To be physically checked. Materials test certificate to be provided by builder.
52	Guard Rails	Stainless steel guard rails of min 20 mm dia with stanchions shall be provided around the main deck as per GA. GA. Stainless steel material for guard rail should be SS-316 storm rails also be provided all along raised deck house.	To be physically checked from location as per GA. Materials test certificate to be provided by builder.
53	Deck	Four is no stainless steel bollards, four in No SS fairlead and four in No SS Cleats	To be physically checked
	Fittings	conforming to SS 316 material. All these fittings shall be fastened through GRP on to a SS backing plate with SS fasteners. The backing plate shall be laid up and covered up with adequate no. of GRP layers. Provision for Towing arrangement should also be provided. Brow should be provided on both sides of the boat for unidirectional movement of person on board with provision of aluminum alloy light weight ladder.	Check load test certificate for each fitting (either from the OEM of the fitting or any other suitable certifying agency post testing).
54	First Aid Box	First aid box to be installed.	To be physically checked
55	Redundancy Aspects	The craft's systems should be designed keeping aspects of redundancy and independent operability in perspective. It should be feasible to isolate defective equipment and fittings without affecting overall performance.	To be physically checked
56	Certificate	The following Certificate and Documents shall be supplied at the time_of delivery of the vessel:- a. Classification Certificate as per construction of boat according to the class notation mentioned at Srl No.2 above issued by Classification Society Rules. b. GA drawing along with other plan approved by class. c. Stability booklet. d. All system like LSA, FFA, fuel oil, bilge, electrical etc as per class requirement arrangement plan to be provided.	Clean approved drawing to be obtained from builder.

S/No		Proposed QRs/Technical Specification	Trial Directive/ Procedure suggested for trial for Board of Officers
57	Bilge system	A suitable bilge alarm system is to be provided to indicate high water level in the bilge. The alarm indication is to be available on the bridge panel. The bilge system is to be designed in accordance with classification society regulation. However, as a minimum a motor/engine driven bilge pump and a manual semi rotary brass bilge pump is to be provided.	Check functioning of bilge pump and alarm system.
58	Deck Machinery and Seamanship Fittings Approved Type	<ul> <li>Following Equipment/accessories shall be provided conforming to Class requirements:- <ul> <li>a) Anchor and cable with windlass and anchor winch as per class requirement and hold the boat in tidal current of 6 Knots speed and wind speed up to 30 Knots.</li> <li>b) Anchor cable/PP rope 60 Mtrs length with adequate breaking strength as per class requirements.</li> <li>c) All lifting appliances and gears to be load tested to static and running load.</li> <li>d) Awning and stanchions for all open deck with parachute canvas cloth/acrylic canvas cloth.</li> <li>e) Two set of acrylic canvas cover for all upper deck fittings and equipment.</li> <li>f) Soft patch be provided for shipping in/shipping out of main engine, generators and heavy machinery installed in the engine room.</li> <li>g) Hawse pipe and Anchor recess.</li> <li>h) Bollards, Mooring/Freeing Ports, and towing arrangements.</li> <li>i) Two in no. Grapinal anchors of 40 Kgs weight with joining shackles.</li> <li>j) Two in nos. polypropylene ropes of 25 mm dia. 40 mtrs length fitted with suitable thimble of SS.</li> <li>k) Cleats and Fairleads.</li> <li>l) Mooring Towing ropes.</li> <li>m) Wire reels.</li> <li>n) Berthing Gear.</li> <li>o) Gangway Opening.</li> <li>p) Guard rail stanchions.</li> <li>q) Embarkation ladder.</li> </ul></li></ul>	To be physically checked
59	Fitting & Fixtures	All fitting fixture to be SS-316 grade unless other metal is suitable for a particular operation or superior	Material test certificate to be provided.
60.	Painting and finishers Painting	<ul> <li>i) Hull area below the waterline shall be painted with a TBT free Anti fouling paint as per the latest IMO regulations.</li> <li>ii) The armament lockers shall be painted with flame retardant painting system.</li> <li>iii) The Mechanized Boat shall be painted in disruptive pattern colour with markings as per user requirement.</li> <li>iv) The Mechanized Boat name, ID No., BSF Emblem and National Flag shall be fixed on both sides of the Hull at superstructure at an appropriate place.</li> </ul>	To be physically checked
61.	Recommend ma	aterial specification for engineering/electrical system – as per Annexure -II to QRs	Check physically with used materia certificate.
62	Document	<ul> <li>a) Priced purchase order copies for ordered equipment/machinery.</li> <li>b) Copy of technical advice floated to various firms for equipment/ machinery be forwarded to BSF simultaneously.</li> <li>c) All drawings are class approved – 03 set copy.</li> <li>d) Ships maintenance schedule, Trials protocols for BSF final approval (Six copies per</li> </ul>	To be checked physically

S/No	Proposed QRs/Technical Specification		Trial Directive/ Procedure suggested for trial for Board of Officers
		<ul> <li>craft).</li> <li>e) As built final building specification, as fitted drawing and consolidated schedule of piping, painting, insulation, paneling and deck lay-up on delivery of craft(three copies per craft).</li> <li>f) Manual with regards to installation, operation and maintenance of various equipment/fittings systems and part identification list of all machinery and equipments (three copies per craft).</li> <li>g) Service manual of engine/all equipment.</li> <li>h) Tools for engine specified/required for maintenance as per OEM.</li> <li>i) Docking plan to be provided.</li> <li>j) Details of onboard spares for 5 years to be provided.</li> </ul>	
63	Spares	List of onboard spares for 01 year and B&D spares for 05 years for engine and gearbox shall be prepared by the boat builder based on OEM recommendations. One set of OBS and base depot spares for each boat shall be supplied by the boat builder. The boat builder will furnished the OBS and base depot list with tender documents.	To be checked physically.
64	Guarantee/ Warranty	Guarantee & warranty services on site (BSF deployment location) shall be provided by the OEM/authorized service agencies of respective machineries. The OEM service provider shall provide the past service performance of such engines for last 05 years.	

तकनीकी विशेषज्ञों के उप समूह द्वारा यह निश्चित किया गया है कि उक्त गुणातमक आवश्यकता को अधिक बेहतर बनाने के लिए गृह मंत्रालय एवं सीमा सुरक्षा बल की वैबसाईट पर विक्रेताओं/फर्मों के सुझाव प्राप्त करने हेतु 15 दिनों के लिए अपलोड किया जाए।

नोट – सभी विकताओं / फर्मों से निवेदन है कि अपने सुझावों के साथ निम्नलिखित कागजात संल्गन कर ई—मेल पता comdtord@bsf.nic.in पर भेजने का श्रम करें:–

- 1. उत्पाद की वास्तविक विवरण पुस्तिका।
- 2. उत्पाद की साहित्यिक रचना का ब्यौरा।
- 3. गुणातमक आवश्यकताओं के उपर व्यापक टिप्पणीयाँ।

(दिगेन्द्र सिंह पॅवार) उप कमांडेण्ट (आधुनिकीकरण)