DIRECTORATE GENERAL NATIONAL DISASTER RESPONSE FORCE
A-WING, SECOND FLOOR, LOK NAYAK BHAWAN, KHAN MARKET,
NEW DELHI-110003

CORRIGENDUM NOTICE NO. 01
(Consisting of 02 pages only)

With reference to discussion/clarifications on points/suggestions relating to commercial/Technical terms & conditions, following changes/amendments be incorporated in the relevant terms and conditions given in our Tender Enquiry No.1-17018/PROC/1212/HQ-NDRF/2016/1013 dated 02.09.2016 for procurement of 624 Nos Inflatable Motor Rescue Boat for NDRF Bns :-

SN	FOR CLAUSE	READ AS
01	**CONDITION OF TENDER PARA-10 (i) :: CAPACITY VERIFICATION** **PARA-10(i) :** Firm should submit works approval of Indian Register of Shipping (IRS) or any other classification agency for manufacture of Inflatable Motor Rescue Boats.	**CONDITION OF TENDER PARA-10 (i) :: CAPACITY VERIFICATION** **PARA-10(i) :** Firm should submit works approval of Indian Register of Shipping (IRS) or any other classification agency for manufacture of Inflatable **Rubber** Motor Rescue Boats.
	PARA-10(iv): Bids of only those firms who have successfully supplied inflatable/other boats for a total value of at least Rs.5 Crore in the preceding three years shall be treated as eligible.	**PARA-10(iv): Bids of only those firms who may submit the bank solvency certificate for Rs. 3.26 Crores. (40% of the approximate estimated value of tender) shall be treated as eligible.** **(The solvency certificate shall be from a nationalized or scheduled bank and issued within a Period of 01 month from the final date of submission of tender. Validity period of the Solvency Certificate shall be 12(twelve) months from the date of issue of certificate by the Bank. The Solvency Certificate without date, seal and signature of the issuing authority shall be rejected)**
03	**PARA-40(i)** The firm has to mention prevailing Custom Duty/ other taxes in the proforma along with price bid and must attach copy of Govt. notification in this regard. If Custom Duty/ any other taxes is quoted /reflected as "Nil" or "Zero" under relevant column of Price Bid, no Custom Duty Exemption Certificate (CDEC)/any other tax exemption will be granted. Subsequently, upon placement of Supply Order, no further request will be entertained in this regard.	PARA-40(i) The firm has to mention prevailing Custom Duty/ other taxes in the proforma along with price bid and must attach copy of Govt. notification in this regard. If Custom Duty/ any other taxes is quoted /reflected as "Nil" or "Zero" under relevant column of Price Bid, no Custom Duty Exemption Certificate (CDEC)/any other tax exemption will be granted. Subsequently, upon placement of Supply Order, no further request will be entertained in this regard. **Note:- No custom duty exemption certificate will be provided by the NDRF.**

04	**SCHEDULE-II :: SPECIAL INSTRUCTIONS PARA-13(i)** As per appendix-6 of TE	**SCHEDULE-II :: SPECIAL INSTRUCTIONS PARA-13(i)** **The inflatable crafts supplied shall bear a warranty of the contractor, against defective material, workmanship and performance for a period of 24 months from the date of receipt of the consignment of the stores. During this period if any of the stores supplied found defective the same shall be replaced by the contractor free of charge at the consignee place as soon as possible and in any case not later than one month from date of receipt of intimation by the contractor. Delay in replacement/repair beyond one month shall invite penalty @ 0.5% per week or part thereof of the cost of goods/stores/parts/assembly in question. In addition Inflatable crafts should have manufacturers /builders warranty for 05 years for the fabric used and 24 months for the adhesion at joints, under normal exploitation.**
05	–	**SCHEDULE-II :: SPECIAL INSTRUCTIONS PARA-16** Language of all bid documents, correspondences and technical literature etc. shall be English only. The bidders are required to submit their price bid/EMD/PSD in Indian rupees only.
06	**SCHEDULE-V :: TECHNICAL SPECIFICATION** **- Deleted -**	**SCHEDULE-V :: TECHNICAL SPECIFICATION** Revised Technical specification attached as Annexure-I of this corrigendum.

Note: - (a) Remaining terms and conditions of the TE will remain unchanged.

(b) **Any changes/modifications in this Tender enquiry will be intimated through CPPP portal https://eprocure.gov.in./eprocure/app and our websites www.ndma.gov.in & www.ndrfandcd.gov.in** such, the tenderers are requested to visit our websites regularly.

No. 1-17018//PROC/1212/HQ-NDRF/2016/1221

Dated, the 18 **Oct, 2016**

(Ashish Sharma)
Dy. Comdt. (Proc)
For and on Behalf of President of India
Dy. Commandant
(Procurement)
Directorate General (NDRF)
Ministry of Home Affairs
New Delhi

4.5 M INFLATABLE BOAT, TECHNICAL SPECIFICATION

1. **Scope:**
This specification relates to the detailed requirements for the design, construction, tests & trials, documentation and warranty of 4.5 m Inflatable Boats, intended for NDRF.

2. **FUNCTIONS**
2.1 The inflatable boat shall perform the following tasks:-
(a) Search & Rescue during floods
(b) Transport men and material

2.2 The boat shall be designed to be seaworthy and carry out functions listed at Para 2.1 with full complement and at speeds (not less than 05 knots commensurate with 40HP OBM). The craft shall be stable and should meet swamp & stability requirement specified at Para 17.16 of this Specification.

2.3 The boat shall be designed to have good manoeuvrability and throttle response throughout its speed range (using 40HP OBM 4 stroke) and particularly when coming alongside or breaking away from an underway vessel at its full load and complement.

3. **Principal Particulars.**

(a) Length Exterior	–	Not less than 4500 mm
(b) Breadth Exterior	–	Not less than 1960 mm
(c) Length Interior	-	min. 3200 mm
(d) Breadth Interior	–	min. 1000 mm
(e) Dia. of Buoyancy Tube	-	Not less than 480 mm
(f) Carrying Capacity	–	10 men (82.5 Kg per person)
(g) Weight of the craft	–	Not more than 90 kg for Boat and not more than 40 kg for the floorboard & accessories (Without OBM)

3.2 The craft shall be built of Buoyancy Tube made of Composite Fabric consisting of Hypalon (outer layers) and Neoprene (inner layers) of 1670 Dtex or equivalent, inspected by IRS as per ISO 15372. The bottom floor of the boat shall be made of the same fabric as buoyancy tube. Reinforcement of the boat shall be provided using rubberized strips of Hypalon (outer layer) and Neoprene fabric (inner layer). The stern of the boat formed by a transom shall be made of Marine Plywood on which OBM can be mounted.

4. **APPROVAL AND INSPECTION BY INSPECTION AUTHORITY**
4.1 The Craft is to be constructed under the approval of Indian Register of Shipping (IRS) in accordance with ISO 6185, Part 3 (2014) and the minimum requirements specified this requirement. Parameters not mentioned in this specification would be in accordance with ISO 6185, Part 3 for inflatable crafts, so as to ensure that the craft meets all functional/material requirement specified in this specification.

Class approval shall cover following aspects:-

(a) Design vetting

(b) Drawing approval
(c) Material Inspection
(d) In-process Inspections

(e) Tests & Trials

5.CONSTRUCTION DETAILS

Buoyancy Tube

5.1 The material used for buoyancy tube shall be of Hypalon (outer layers) and Neoprene (inner layers) composite fabric, of 1670 Dtex or equivalent inspected by IRS as per ISO 15372. The Buoyancy Tube shall be divided in to a minimum of 04 air tight compartments by means of baffles/bulk-heads. Each compartment shall be fitted with a combined inflation/deflation valve. The valves shall be made of rubber moulding and plastic nylon material or alternate marine grade material approved by class. The valves should be of reputed make and approved by Classification society for use on inflatable crafts.

5.2 The ends of the tube shall be conical and should terminate in suitably stiffened rubber conical flat ends to take impact loads during coming alongside/lowering. The two legs of the Buoyancy Tube shall be parallel and the width readings at the transom and at midship shall not differ by more than 3%.

5.3 The tube shall be strong enough to sustain the effects of ramming whilst coming alongside. The upper layer shall be strong enough to bear the rubbing impact against rough surfaces. In addition, an emergency repair kit with quick drying adhesive and ready use repair patches shall be provided.

5.4 The construction of the Buoyancy Tubes should be in accordance with class approved drawings and production processes.

5.5 The attachment of bulkheads in the buoyancy tube shall be such that each chamber is rendered air tight under specified pressure.

5.6 The seams in the buoyancy chambers shall have an overlap not less than 3cm width and should be pasted with cold glue vulcanisation process or equivalent Class approved process. An additional strip is to be glued at the edge of each panel junction as well as strip inside all assembled parts in order to ensure a perfect water tight preventing from any leakage.

Inflation/Deflation Valve

5.7 (a) The Inflation/Deflation valve shall combine a high pressure air connection with a deflation valve in each air tight chamber and shall be as per ISO 6185-3 (2014).

(b) The valve shall be fitted proud of the buoyancy tube on inner side of the buoyancy tube to enable identification/location in darkness.

(c) The material of inflation/deflation valve fitted on the buoyancy tube shall be of suitable material for marine application.

(d) Alternate design/arrangement for inflation/deflation valves which meet the above functional requirements is acceptable subject to the approval of Classification Society.

Floor

5.8 The floor shall be made of Hypalon (outer layers) and Neoprene (inner layers) composite fabric, of 1670 Dtex or equivalent inspected by IRS as per ISO 15372. The floor shall be bonded to the underside of the buoyancy tube and attached by a floor retaining strip to the transom board. It shall be strengthened on its underside in way of the keelson by a keelson chafing strip of minimum 100 mm wide fabric. Chafing strips shall also be bonded to the underside at the after ends of the tubes.

5.9 Special attention shall be paid to the attachment of the floor to the buoyancy tube to ensure that the resulting joint is water tight. Special care is also to be taken that the floor is perfectly taut and smooth and has no puckers, when the craft is assembled and ready for use.

Self Bailers/Drain Valves

5.10 Two self bailers akin to NRV shall be located on the lowermost part of the transom board near the rear end fitment of the keel close to the centre line. The same shall be provided with a flexible flap to overcome pressure on the NRV in following seas. The self bailers shall automatically remove water from the craft at higher speeds.

Transom

5.11 The transom board shall be fitted and securely bonded to the buoyancy tube and the floor so as to provide a water tight joint. The Transom shall be designed for use with 40 HP OBM. The transom shall be made of marine plywood coated with FRP/GRP of appropriate thickness and to be suitably fitted out with engine mount made of marine grade Aluminium alloy plate and chafing patch. Hypalon coated fabric shall be pasted on the surface area of the transom to prevent it from damage as well as loosening from the tube body. Separate strip of suitable size shall be provided on the bottom of the transom to minimize chance of damage. Details regarding craft identification No. etc. shall be engraved on a builder's plate fitted on the inner side of the transom on starboard side. Towing rings, cleat and 'U' bracket shall be provided as per approved drawing.

Floor Boards

5.12 The Floorboards shall be made of High Strength Tempered Anodised marine grade Aluminium alloy with a non-skid finish. These boards (four/five pieces) shall be interconnected together to form a rigid platform. The forward/bow piece of floorboard may be made of marine plywood (IS 710) coated with FRP lamination.

Alternatively, Floorboard can be made of High Strength Tempered Anodised marine grade Aluminium alloy roll-up floor with a non-skid finish on top to form a rigid platform.

Keel

5.13 The boat shall be provided with inflatable keel of suitable size to provide the rigidity & stability during operation of boat.

Stowage Pockets

5.14 Minimum One Stowage pockets shall be attached to the buoyancy tube in the forward in board side. The stowage pockets provided shall be capable of holding dynamic weight of 6 Kgs. Holes are to be provided at the bottom of the pocket to drain water (Size 340mm x 280mm x 90mm).

Rubbing Strips

5.15 Following single piece Rubbing Strips of moulded neoprene rubber of 2" width (where not mentioned) and extending along the entire length shall be attached to the buoyancy tube for the protection of the craft:-

(a) Bow rubbing strip 4".
(b) Outer anti chafing strip 100mm wide on both sides.
(c) Anti Chafing Strip under Keel.

(d) Two Beaching Strips 100 mm wide under buoyancy tubes
(e) Chafing patch for coxswain's position

Carrying Handles

5.16 Minimum Four Carrying handles shall be provided, two on each side and one front lifting handle. The handles shall be suitably reinforced to take a weight of 300 kgs all together. The handles shall be of Moulded Neoprene Rubber bonded to the buoyancy tubes.

Towing Fittings and Securing Arrangements

5.17 Following Towing fittings shall be provided. Towing fittings shall consist of suitably sized D Shackle of SS AISI 316(to pass towing rope) securely attached to fabric reinforcing patches bonded to the buoyancy tube.

(a) Towing/ Lifting fittings, forward – One on either side of the craft, below the buoyancy tube at the beginning forward curve in the buoyancy tube.

(b) Towing fittings, aft – One on either side on the transom, shall be used if craft is employed for towing purposes.

(c) Load Test. The towing arrangement shall be load tested as per ISO 6185-3.

Oars & Oar Securing Assemblies

5.18 Two nos. of oars to be provided. Oars shall be positioned parallel/30° to the vertical when secured inside the inboard side of buoyancy tubes. Adequate securing arrangement shall be provided so that the oars are intact.

Foot Bellow pumps

5.19 Heavy duty bellow type foot pump(reputed make) of suitable design shall be provided to inflate the craft in approximately 20 minutes. The housing of pump is to be made of a heavy duty yet light-weight marine composite. The bellow to be made of coated reinforced fabric and all metal parts should be of stainless steel. In addition, one heavy duty electric inflation pump of reputed make (12 V DC) and one pressure guage (capable of measuring pressure of tubes) of reputed make to be provided.

Fabric Fittings

5.20 Patches, doublers, anchorages, etc. shall be made and positioned as shown on the drawing which indicates finished size. Suitable tape/webbing reinforcement shall be used to distribute stresses adequately.

Grab line

5.21 There shall be grab line nylon braided (as per IS 4227) of dia. min. 12.0 mm all along the sides for safety to be provided.

6.0 MATERIAL SPECIFICATIONS

6.1 Material Specification for the various items to be used for construction of Inflatable crafts are as follows:-

a) The Material Specification for buoyancy tube, inflatable keel and floor Hypalon (outer layers) and Neoprene (inner layers) composite fabric of 1670Dtex or equivalent as per ISO 15372 and inspected byIRS.

b) The Material Specification for Air deck floor system as per recognized national/international standard.

c) The material specified shall be strictly adhered to and no deviation is permitted. Materials referred to as approved shall be so approved by the Classification Society in accordance with the requirement specified in this Rule.

d) The colour of all exposed surfaces / material shall be highly visible orange color.

Adhesive

6.2 The adhesive shall be Neoprene based contact adhesive of good quality and to be suitable for service in tropical environments as per specification. The adhesive shall consist of a dispersion of polychloroprene in a low boiling point solvent and may have additions of resins to promote building tack. The adhesive shall consist of 2 components, Part 1 and Part 2, Part I being the basic neoprene dispersion and part 2, the accelerator (hardener).

6.3 The adhesive should be approved by Classification Society for use on inflatable and meeting the minimum requirements specified in ISO 6185-3 (2014).

6.4 Alternate adhesive superior in properties are also acceptable subject to approval of Classification Society as per ISO 6185-3 (2014).

7.0 PRINCIPAL COMPONENTS OF BOAT

The principal components of the complete assembly are as follows:

7.1 Hull

7.1.1 Buoyancy tube - Divided in minimum 04 compartments and complete with rubber conical flat ends.

7.1.2 Bulkheads –Dividing the buoyancy tube into min. 4 compartments.

7.1.3 Inflation/deflation valves – one set per chamber.

7.1.4 Transom- fitted with engine mount, anti chaff patch.

7.1.5 Floor - in proofed fabric

7.1.6 Keelson chafing strip – 1 No.

7.1.7 Aft chaffing strip – 1 No.

7.1.8 Inflatable Keel- 1 No.

7.2 Hull Fittings

(i)	High pressure Air deck system	- 1 No.
(ii)	Bow Rubbing strip	- 1 No.
(iii)	Side Rubbing strip Aft	- 1 set
(iv)	Carrying Handles (Patch rubber with handle)	- 4 Nos.
	Grab line	
(v)	-	1 Set
(vii)	SS to AISI - 316 Hook on transom	- 2 Nos
(viii)	SS to AISI - 316 "D" rings	- 2 Nos
(ix)	Repair Kit for Air deck system – 1 set	
(x)	Pockets for stowage	- 01Nos

(One for wireless set & one for inflation bellow pump)

(xi) Oars (Shall be light weight not more than 4Kgs and positively buoyant in water)

(xii) Repair Kit (small) – fabric patches 05, adhesive tube (Dendrite) 500 gm, roughing tool, spanners of required sizes.

7.3 Valises and Store bags

(i) Heavy duty storage bag for Hull – 01 No.

(ii) Heavy duty storage bag for Air deck floor system – 01 No.

(iii) Storage bag for oars & other accessories – 01 No.

7.4 Additional Spares

(i)	Inflation/ Deflation Valves	- 10 Nos
(ii)	Pressure guage	- 01 No
(iii)	Plugs for Water Drain	- 04 Nos
(iv)	NRV for Water Drain	- 10 Nos
(v)	Electric Inflation pump	- 01 No
(vi)	Bellow Inflation Foot Pump	- 02 Nos
(vii)	Patching material with adhesive to repair leak/damage in buoyancy tube & air deck system.	

8.0 PRODUCTION

8.1 Manufacturing of the craft should be as per the detailed drawings approved by Indian Register of Shipping (IRS) and meeting the requirements mentioned in this specification. The production processes should also be approved and supervised by the IRS.

Tolerance

8.3 General tolerances on all dimensions shall be ±1.5 mm unless otherwise specified in this specification or approved by Classification Society. The exceptions to this general limit shall be in respect of stuck-on components length of webbing and cordage, and the overall dimensions of components etc; these items shall be given a sliding scale tolerance which increases in accordance with the magnitude of dimensions.

PRODUCTION DAMAGES

8.4 Any Production damage irrespective of size shall be repaired by complete part / panel replacement only. The replacement is to undertaken by the contractor free of charge at the consignee place as soon as possible and in any case not later than one month from the date of receipt of intimation.

8.5 No patch repair is permitted on buoyancy tube/ floor. In case of production damages only part/ Panel Replacement shall be permitted.

8.6 Where a part panel replacement is necessary, the following parameters shall apply:

(i)On the buoyancy tubes, not more than one part panel replacement will be permitted on each craft.

(ii)On the floor not more than one part panel replacement will be permitted on each craft.

9.0 RECORDS

9.1 The builder shall develop and maintain records that demonstrate the effective operation of his quality control system and shall make these records available for review of the Inspecting agency. Inspection records shall include explicit identification of the material, part sub-assembly, equipment, sub-system or system, the nature and number of observations made, the number and type of deficiencies found the quantities approved or rejected and the nature of the corrective action taken, as appropriate. Records shall be retained until disposal is directed by the Inspector. The contractor shall furnish a copy of any record to the Inspector, on request.

10.0 DRAWING & DOCUMENTS.

10.1 Within one month of placement of order the builder shall submit the design and manufacturing drawings for the approval of the Classification society. Construction of the craft is to commence only after the approval of all drawings by Class. Drawing approval should include approval of Classification Society for component level detailed production drawing required for manufacturing the craft.

10.2 **As Fitted Drawings/Documents.** On successful completion of all tests/trials and prior to the delivery of the specific boat, the Builder shall supply to consignee two sets each of the following as fitted /as made drawings and documents with the craft.

10.2.1 Buoyancy tubes
10.2.2 End cones of buoyancy tube
10.2.3 Floor and details of joint between floor and buoyancy tubes.
10.2.4 Transom with details of joint between transom floor and buoyancy tube
10.2.5 Assembly drawings for keelson and floor board
10.2.6 Fitment details of each of fittings:-
(a) Inflation/Deflation valves
(b) Self bailers
(c) Rubbing Strips
(d) Carrying Handle
(e) Towing fittings,
(f) OBM attachment drawings illustrating Engine support.
(g) Fuel oil/L.O. system with storage provisions

10.3 The builder shall also supply soft copy of all the As Fitted /As Made drawings to the consignee.

11.0 INSPECTION

11.1 The inspection authority for the boats will be Indian Register of Shipping (IRS). The complete inspection of the craft as mentioned at Para 4 of this specification will be undertaken by Classification Society as per approved QAP. Towards this builder will submit the draft QAP for the approval of Classification Society, within one month of placement of order.

11.2 The cost of conducting tests and the material required for the purpose are to be borne by the builder. The suitable OBM (40 HP) and POL for conducting trials shall be provided by the builder at the site of trials. In case the builder premises does not have river front, the builder should transport the first craft to suitable location in India (mainland) specified by the order placing authority.

12.0 User Acceptance of First Craft of Every Order. On successful completion and clearance post clearance from Classification Society, the first boat of the every order will be subjected to extensive user trials covering all functional requirements as well as test & trials brought out in this Specification. The trials shall be conducted jointly by Classification Society and Customer nominated team. Deficiencies observed by the trial team w.r.t the requirements stipulated in this specification should be liquidated by the builder at no extra cost. Subsequent crafts of the order shall be cleared by inspecting agency only after liquidation of all deficiencies observed during user acceptance trials of first craft.

12.0 WARRANTY CLAUSE

12.1 The inflatable crafts supplied shall bear a warranty of the contractor, against defective material, workmanship and performance for a period of **24 months** from the date of receipt of the consignment of the stores. During this period if any of the stores supplied found defective the same shall be replaced by the contractor free of charge at the consignee place as soon as possible and in any case not later than one month from date of receipt of intimation by the contractor. Delay in replacement/repair beyond one month shall invite penalty @ 0.5% per week or part thereof of the cost of goods/stores/parts/assembly in question. In addition Inflatable crafts should have manufacturers /builders warranty for 05 years for the fabric used and 24 months for the adhesion at joints, under normal exploitation.

13.0 INSPECTION AUTHORITY

13.1 The inspection authority for the boats will be IRS.

14.0 DEFLATION AND DISMANTLING

14.1 When deflated and dismantled the craft and components shall be stowed in heavy duty top-proofed PVC coated nylon fabric valises as defined in Para 7.3 above.

15.0 STENCILLING AND MARKING

15.1 The following shall be marked on builder's plate fitted on inner side of the transom starboard side.

BOAT GENERAL PURPOSE

INFLATABLE NO.: ----------
DATE OF SUPPLY: ----------
NAME OF MANUFACTURER : ----------

MAX LOAD CARRYING CAPACITY (KG): ----------
MAX MOTOR RATING (KW): ----------
MAX NO. OF PERSONS: ----------
RECOMMENDED WORKING PRESSURE ----------

15.2 The following parts shall have the identification of the craft permanently marked on them:-

Bottom boards	-	Stencil marking to be made.
Oars	-	-do-
Storage bags	-	-do-
Valises	-	-do-

15.3 The stencilling is to be in black ink, waterproof and of a quality non-injurious to the proofed fabric.

16.0 PACKING INSTRUCTION

16.1 The unit shall be suitably packed to withstand the hazards of rail/road transit and with a view to avoid any damage during transit and safe arrival at consignee's address.

17.0 INSPECTION TEST AND TRIALS FOR PROTOTYPE CRAFT

Physical and Chemical Tests

17.1 Fabric and cordages are to be of approved type. If considered necessary, following physical and chemical tests on samples of various types of fabrics, cordages shall be carried out by Classification Society in order to ensure that these conform to the required designed specifications.

Fabrics

17.2 Prior to starting manufacture, the manufacturer shall submit samples of the fabric to the Inspecting Officer as follows:

Buoyancy Fabric	-	1 Meter long full width
Floor Fabric	-	-do-
Floorboard Fabric	-	-do-

17.3 The testing of fabric shall be arranged at appropriate NABL approved laboratories in presence of IRS Surveyor.

Cordages

17.4 Test certificates in respect of these items issued by an independent testing authority, where possible or by the manufacturer may be accepted. In case of doubt the purchaser's Inspector may draw samples for testing at the approved Laboratories.

Dimensions

17.5 The dimensions of the craft shall be measured with the craft inflated and completely rigged.

17.6. The diameter of the buoyancy chambers shall be taken at 3 points along

each parallel side. The width shall be measured at the transom and at a point midship. The internal lengths shall be measured between a pump line from inner one of the buoyancy tube to the bottom end of transom along the floorboards.

Air Inflation Tests

17.7 The under mentioned tests shall be carried out of the craft when completed with all fittings. During the tests draughts shall be guarded against and the temperature shall be kept as constant as possible throughout the test.

17.7.1.1 For every 1^0 Centigrade (1 degree Fahrenheit) rise above the temperature at commencement of the test, 0.004 bar (0.058 PSI or 1.5 inch of water) is subtracted from the final pressure reading and for every 1^0 Centigrade (1 degree Fahrenheit) fall in temperature 0.004 bar (0.058 PSI) shall be added to the final pressure reading. If the temperature variation during the period of the test is greater than 3.0^0 C the test is invalid and a further test shall be made under more constant temperature conditions. Accurate thermometer readings shall be taken.

Inflation Test

Preliminary Inflation Tests

17.8 The whole of the buoyancy tube shall be inflated 1.2 times of nominal pressure defined by manufacturer (but min. 2 PSI (55 inches of water)to pre-stretch the boat and left for 30 minutes. The pressure at the end of this test shall not be noted, but craft examined for undue stretch or distortion.

Air tightness Pressure Test

17.9 The whole of the buoyancy tube shall be inflated to nominal pressure defined by manufacturer (but min. 0.14 kg/cm^{2}or 2 PSI) and left for 24 hrs., the pressure drop after correction for temp. change shall not be greater than 20% in any compartment.

Bulkhead/Overpressure Test

17.10 Each Chamber of the buoyancy tube shall to be inflated to 1.5 times of nominal pressure defined by manufacturer (but min. 3 PSI) with all other chambers remaining deflated and left for 30 minutes. No damage or rupture shall occur. Fall in pressure corrected for change in temperature shall not to exceed 0.012 Kg/cm^2 or 4.5 inch of water column.

17.11 The tests stipulated in 17.12 to 17.15 below shall be carried out in calm conditions in smooth water. Service Floor Boards with additional 10 Kg weight shall be used for the tests.

Floatation Test

17.12 Each craft shall be inflated and assembled complete with keelson and bottom boards. It shall be floated in water. A load of 825 Kg shall be distributed evenly over the floor boards and the craft left floating for 30 minutes. No leakage of water is to occur. Any defects found at the conclusion of this test shall be made good by the builder.

Free Board

17.13 The free board of the vessel when floating fully inflated in calm water and loaded with a test load of 825 Kg. shall not be less than 1/6th the diameter of the main buoyancy tube, forming a side of the vessel, such free board being measured at mid length of the vessel.

Assembly/ De-assembly

17.14 It shall be proven that the craft can be assembled and de-assembled as per standard procedures.

Deflation

17.15 Deflation tests shall be carried to prove that the craft can be successfully deflated.

Swamp & Stability Examination

17.16 Swamp & stability check to be carried out as per ISO 6185-3.

Damage Test

17.17 The craft shall be capable of supporting 825 kgs with any two alternate compartments deflated.

Power Trials

17.18 Power trials with the outboard engine (40hp OBM) shall be conducted under various loads (light load & full load min.) along with turing circle, maneuverability trials, crash stop and performance of the boat shall be satisfactory during trials.

Towing Tests

17.19 (a) The boat shall be tested in the manner described below.

(b)Embark the maximum number of persons reckoned and position them uniformly within the seated area.

(c)Tow the boat by its towing point at a speed of not less than 4 knots, allowing a tow line length of 3 boat length.

(d)Carryout manoeuvres for not less than 15 min.

(e)The boat shall be closely examined at the end of the test period for any structural failure in the form of fracture, tear etc on any part of the hull or boat component, such as deck or thwarts, and including any boundary interface such as floor/hull.

(f)The point of attachment of the tow line shall remain secure during the period of the test.

(g)Evidence of any of the referred-to structural failures shall be regarded as failure of the boat.

Righting Test

17.20 The capsized craft shall be capable of being righted by two men with an average weight of 82.5 Kg each. For this test if two men each weighing 82.5 Kg are not available, then 3 men whose total weight does not exceed 250 kgs may be used. During this test, the craft shall be in its light condition with no engine and or other equipments fitted in the craft

Rowing test for Oars

17.21 It shall be proved that the craft loaded with 825 can be oar propelled. The craft shall be turned, brought alongside etc. The test shall be conducted over a distance of 300 meter in light load & full load condition of attachment to tube shall be examined for any damage.

18.0 TEST SCHEDULE FOR PRODUCTION CRAFTS

18.1 **Fabrics:** Clause 17.2 applies

18.2 **Cordages:** Clause 17.4 applies

18.3 **Dimensions:** Clause 17.5 applies

18.4 **Other Tests:** Test prescribed in clauses 17.7 to 17.21 shall be carried out on all crafts except for 17.16, 17.17 & 17.20 which required only on first boat of the order unless there is no changes in stability or design data.

18.5 Minimum 20 nos. of boats to be offered in a lot for inspection.

19.0 COMPLETION

19.1 The craft shall be completed in all respects to the satisfaction of the Inspector. All items of equipment to be checked. The craft shall be assembled on the shop floor and a check is to be carried out that the parts fit properly.

19.2 On completion of all tests and examinations the hull and bottom boards, etc. shall be packed into their valises, before dispatch.

NOTE

01 The confirmation that the stores are meeting the specification should be supported by adequate Documents/Literature etc.

02 These documents of all stores offered be numbered and attached after all appendices and the numbering may be in continuation.

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