REQUEST FOR INFORMATION (RFI)

FOR PROCUREMENT OF 06 X LANDING CRAFT UTILITY MK V (LCU MK V)

1. The Indian Navy under Ministry of Defence, Government of India, is planning to procure **06 (six) X Landing Craft Utility (LCU) MK V** from registered Indian Shipyards. With a view to identify probable shipyards who can undertake the construction 06 X LCU MK V, the Shipyards are requested to forward information as sought in this RFI. The aim of seeking this RFI is also to finalise the specifications for the 06 X LCU MK V with inputs from the Shipyards.

2. This Request for Information (RFI) consists of three parts as indicated below:-

(a) **Part I**. The first part of the RFI incorporates operational characteristics and features that should be met by the 06 X LCU MK V. Few important technical parameters of the proposed 06 X LCU MK V are also mentioned.

(b) **Part II**. The second part of the RFI states the methodology of seeking response of Shipyards. **Submission of incomplete response format will render the Shipyard liable for rejection. It is highlighted that in accordance with Paras 13, 70 and 92 of Chapter XII of Defence Acquisition Procedure (DAP) 20, there is a need to undertake capacity assessment of a shipyard prior recommending for issuance of Request for Proposal (RFP) for ship or Yardcraft construction irrespective of shipyard's response to this RFI** (Appendix C to Chapter XII of DAP 20 relevant).

(c) **Part III**. Guidelines for Framing Criteria for Vendor Selection/ Pre-Qualification in respect of 06 X LCU MK V under Buy (Indian-IDDM) category.

3. Apart from the information sought as per the Appendices, the shipyards may also forward technical details/ brochure/ preliminary design/ literature, etc., as deemed appropriate with respect to this said RFI for Procurement of 06 X LCU MK V.

PART- I

4. **Intended Use of 06 X LCU MK V (Operational Requirements)**. These are specified in the brief requirements placed at **Appendix A** of this document.

5. **Important Technical Parameters**. Important Technical Parameters are placed at **Appendix A** of this document. Detailed specifications will be given in the RFP which will be issued to Shipyard after verifying their credentials and capabilities to construct 06 X LCU MK V. Further following details are to be submitted: -

(a) Feasibility to build 06 X LCU MK V as per technical/ operational parameters and specifications indicated at **Appendix A**. The shipyards are required to furnish details for each of the operational and technical parameters as brought out in **Appendix A**. Any modification to the parameter/ specifications listed at **Appendix A**, can be suggested by the Shipyard with suitable justification(s).

(b) Shipyard to submit the concept design for the Vessel and option of providing upcoming technologies, if any, which will meet the intended purpose of the Vessel and enhance its employability. Further, Shipyard to indicate

Technological advancement in the field of 06 X LCU MK V construction/ recommendations for induction of new equipment/ systems onboard the 06 X LCU MK V.

(c) Agreement and / or collaboration with firms with regard to Design and Construction of the Vessel.

(d) **Budgetary Quotation**.

(i) Budgetary quote (**Basic Cost** and **Vessel Cost**) of the 06 X LCU MK V with detailed break up of cost is to be submitted as per format given below.

Ser	**Items**	**One Barge cost**
(aa)	Material cost including Yard material like steel, aluminum etc.	
(ab)	Indigenous and Imported equipment cost	
(ac)	Equipment and Material Overheads	
(ad)	Labour and Labour Overheads	
(ae)	Direct and Indirect Direct Expenses	
(af)	Miscellaneous Cost	
(ag)	First outfit of Naval stores	
(ah)	**Basic Cost of Barge** {Total of Ser (aa) to (ag) above}	
(aj)	Cost of Onboard Spares (OBS)	
(ak)	Cost of Special Maintenance Tools and Special Test Equipment and software	
(al)	Cost of Technical Documentation, Training and Training Aggregates	
(am)	Freight and Transit Insurance Cost	
(an)	**Vessel cost** {Total of Ser (ah) to (am) above}	
(ap)	**Foreign Exchange Component,** if any, be indicated.	

(ii) All entities factored in the costing are to be indicated in the break up. Details of export / import duties and Foreign Exchange Component, if any applicable, to be indicated separately.

(e) Information on whether the offered Vessel/ design is in use by any other Indian Customer is to be indicated.

(f) The Vessel will be operated by Manpower/ Crew as indicated in **Appendix A**. The maintenance of the Vessel post guarantee period will be carried

out by Naval Dockyards/ Naval Repair Yards. Training to ***IN*** personnel on operation and maintenance is to be imparted by the Shipyard/ Original Equipment Manufacturer (OEM) of equipment at Shipyards/ OEM premises and (or) ***IN*** premises. Shipyard to submit proposed training schedule for crew and maintainers covering all the equipment fit and auxiliary systems installed in the Vessel in accordance with DAP-20. Further, shipyard to indicate acceptance to conduct the training at OEM premises and shipyard premises for the crew and maintainers.

(g) The tentative delivery schedule / build period for delivery of the Vessels to ***IN*** after conclusion of contract including the build strategy.

(h) Shipyards may consider this RFI as advance information to obtain requisite Government clearances and setting up of necessary infrastructure both in terms of manpower and material requirements.

(j) Shipyard has to confirm its acceptance with the terms of payment as per Chapter XII, Section B, Para 79 and Appendix B to Chapter XII of DAP 20 and amendments thereof.

(k) Experience in building/ supply of Vessel which meets the requirement as listed in this document, along with details of customer/ clients and cost per Vessel, delivery date, etc. will have to be submitted.

(l) Willingness for Option Clause as per Para 93 of Chapter II of DAP 20.

(m) The shipyard to submit copy of Government license relevant for ship construction/ building activity.

(n) Shipyard is to indicate the compliance and/ or conformity to various industrial and classification society rules and standards related to operations and safety such as Indian Standards Institute (ISI), CE, MIL (Military) Spec, Information Technology (IT) related etc., for various components/ sub-components of the Vessel as applicable.

(p) Whether the shipyard would be able to comply with all provisions of DAP 20 or not. If not, which Para/ Clause of DAP 20 would not be agreed to, with reasons, needs to be submitted.

(q) Shipyards to provide inputs on maintenance philosophy (Engineering Support Package (ESP), Annual Maintenance Contract (AMC), Performance Based Logistics (PBL), etc.). In this regard, Para 51 and Appendix F of Chapter II of DAP 20 is relevant.

(r) Shipyard has to confirm its acceptance with the terms and conditions on obsolescence of the component/ parts of equipment of the Vessel, which may become obsolete, during the life cycle of the Vessel as per DAP 20 and amendments thereof. Further, Shipyard to submit details/ plan for envisaged upgradation of equipment for obsolescence management and details with respect to repair facilities may also be submitted.

(s) Shipyard has to confirm its acceptance to follow all the provisions of Chapter XII, Section-B of DAP 20 regarding acquisition of Yardcraft and Auxiliaries

on competitive basis. If not, which Para/ Clause of Chapter XII of DAP 20 would not be agreed to, with reasons, needs to be submitted.

(t) **Acceptance Trials**. Shipyard to submit details with respect to Acceptance Trials, including parameters for product evaluation.

(u) **Alternatives for same/better Operational Requirements**. Shipyard to provide inputs/recommendation with respect to any alternatives to meet the same/better operational requirements.

(v) **Compliance to Environmental Norms**. Shipyard to submit compliance to environmental standard for weather, corrosion resistance etc.

(w) **Undertaking Certificate**. Shipyard to submit an undertaking that in the past they have never been banned/ debarred from doing business dealing with MoD/ GoI/ or any other Govt organization.

(x) **Indigenous Content (IC)**. Shipyard to submit details of IC in the Vessel to meet the minimum IC requirement in accordance with Para 21 of Chapter I of DAP 20. The categorisation for the procurement is intended to be under Buy (Indian - IDDM).

(y) Shipyards are required to provide following details: -

(i) Displacement / dimensions of the Vessel.

(ii) Proposed Delivery Schedule of the Vessel.

(iii) Details pertaining to capacity, infrastructure, financial status of the Shipyard to be furnished and how it is intended to be used to meet the delivery schedule of the Vessel.

(iv) Past experience of Shipyard in executing similar projects.

(v) Details of present order book status to be furnished.

(z) **Field Evaluation Trials/ Trial Methodology**. Shipyard to submit Field Evaluation Trials/ Trial Methodology wrt mode of FET (Physical Trials/ Documentation/ certification/ Simulation) and Trial Methodology, including parameters for product evaluation and the necessary of trials abroad (if any).

(aa) **Use of Indigenous Military Materials and Software**. Shipyard to submit information wrt utilization of Indigenous Military Material and Software, indicating the plan for material sourcing and cost implications vis-à-vis foreign sourcing of materials iaw Para 11 and 13, Chapter II of DAP 20.

(ab) **Critical Activities and Estimation Timelines**. Shipyard to submit critical activities/ milestones and estimated timelines for various phases, total timeframe for implementation of the project and critical phases most susceptible to slippages.

6. The Shipyard should confirm that following conditions are acceptable: -

(a) The solicitation of offers will be as per 'Single Stage -Two Bid System'. It would imply that a 'Request for Proposal' would be issued soliciting the technical and commercial offers together, but in two separate sealed envelopes. The validity of commercial offers would be at least 18 months from the date of submitting of offers.

(b) The financial assessment parameters would be evaluated by a Financial Parameter Evaluation Team (FPET) constituted by SHQ prior to Technical Evaluation Committee (TEC). The technical offers would be evaluated by a TEC to check its compliance with RFP.

(c) Amongst the Shipyards cleared by TEC, a Contract Negotiations Committee (CNC) would decide the lowest cost bidder (L1) and conclude the appropriate contract.

(d) Vendor would be bound to provide product support for time period specified in the RFP, which includes spares and maintenance tools/jigs/fixtures for field and component level repairs. Documentation for training/ maintenance/ repairs are also to be provided.

(e) The vendor would be required to accept the general conditions of contract given in the Standard Contract Document at **Chapter VI** of **DAP 20**.

(f) **Integrity Pact and Earnest Money Deposit (if applicable)**. An Integrity Pact is to be submitted at the time of bid submission as indicated below (Refer **Annexure I** to **Appendix O** of **Schedule I**, **Chapter II** of **DAP 20)**: -

(i) **Pre Contract Integrity Pact (PCIP)**. All vendors will be required to submit a PCIP **for all procurement schemes above Rs 20 Crores** along with their technical and commercial offers. **Earnest Money Deposit (EMD) will act as security for PCIP till signing of contract**. **Format of EMD is given at Annexure I to Appendix O of schedule I to Chapter II**. **Post signing of contract, PCIP will be covered by PWBG till completion of contract**.

(ii) EMD would be applicable as follows:-

Estimated Cost of Procurement Scheme (in Crores)		**EMD Amount**
Above (not including)	**To (including)**	
-	100	Nil
100	150	30 Lakh
150	300	70 Lakh
300	1000	2 Crore
1000	2000	5 Crore
2000	3000	10 Crore
3000	5000	15 Crore
5000	-	25 Crore

(iii) EMD is not required from Micro and Small Enterprises (MSEs) as defined in MSE Procurement Policy issued by Department of Micro, Small and Medium Enterprises (MSME) or are registered with the Central Purchase Organization or the concerned Ministry or Department or Startups as recognized by Department of Industrial Policy & Promotion (DIPP), in accordance with the Ministry of Finance memorandum bearing No. F.20/2/2014-PPD (pt.) dated 25 Jul 2017 (as amended from time to time). Defence Public Sector Units (DPSUs) are not required to submit EMD when nominated as ab-initio single vendor. DPSUs will submit all BGs and EMD as applicable while participating in multi-vendor cases with private vendors.

(iv) **Format of EMD**. The Bid Security may be accepted in the following forms, safeguarding the Buyer's interest in all respect: -

(aa) Bank Guarantee from any Indian Public or Private Schedule Commercial Bank notified by RBI or first-class banks of international repute. The format of the Bank Guarantee for Bid Security is provided at Annexure 1 to Appendix O of schedule I to Chapter II. The bidder may also submit EMD in the form of electronic Bank Guarantee (e-BG). UIN Number of beneficiary (Directorate of Ship Production) is **NCDGS1230P**.

(bb) Account Payee Demand Draft, Fixed Deposit Receipt, Banker's Cheque shall be payable in an acceptable form. The Beneficiary Bank Details for furnishing the same are as follows: -

(IFSC CODE - SBIN0000691)
State Bank of India New Delhi Main Branch
C Block, 11 Parliament Street
New Delhi, Pin: 110001

(v) **Validity of EMD**. The EMD will be valid for eighteen months or till signing of contract, whichever is later. The EMD shall be extended from time to time as required by the buyer and agreed by the bidder. No interest shall be payable by the buyer to the Bidder(s) on the EMD for the period of its currency. For unsuccessful bidders EMD will be returned on declaration of successful bidder(s).

(g) **Performance-cum-Warranty Bond**. Performance-cum-Warranty Bond both equal to 5-10% value of the contract inclusive of taxes and duties is required to be submitted after signing of contract as per current PWBG rate promulgated by Ministry of Defence (MoD). However, the final amount of PWBG will be applicable as per the rate promulgated by MoD from time to time and in force at the time of tender submission.

(h) **Performance Bank Guarantee for AMC**. A Performance Guarantee by the way of a Bank Guarantee of a sum equal to 5-10% of the total price of AMC for contracted duration is required to be submitted after signing of contract as per current rate promulgated by Ministry of Defence (MoD). However, the final amount of BG will be applicable as per the rate promulgated by MoD from time to time and in force at the time of tender submission.

(j) **Indigenous Content (IC)**. The procurement of the Vessel will be as per DAP 20, and accordingly shipyards are required to submit the details regarding Indigenous Content (IC). The categorisation for the procurement is intended to be under Buy (Indian - IDDM). The Vessel must meet the minimum IC parameters in accordance with Para 21 of Chapter I of DAP 20 and MoD ID NO. 5(07)/2023/DAC Sectt dated 15 Jan 24. The Shipyard is also required to comment on the categorisation and IC content as per DAP 20. The category wise (less Strategic Partnership model cases) summary of IC as per cost of the **Base Contract Price** (i.e. Total Contract Price less cost of AMC /CMC/ After Sales Service) will be as under:-

Ser	Category	IC
(i)	Buy (Indian-IDDM)	Indigenous design and ≥ 50% Minimum 50% of overall IC as stipulated for all categories of procurement cases to be in the form of material/ components/ software that are manufactured in India.

PART-II

7. **Procedure for Response**

(a) Vendors must fill the form of response as given in **Appendix B** (as per **Annexure II** to **Appendix A** to **Chapter II** of **DAP 20)** and **Appendix C** of this document. Apart from filling details about company, details about the exact product meeting other generic technical specifications should also be carefully filled. Additional literature on the design and construction of Barges can also be attached with the form.

(b) **The Shipyard to submit separate enclosure clearly indicating compliance with the operational/ technical specifications placed at Appendix A of this RFI. Non-Compliance to any of the parameters listed in Appendix A, has to be clearly indicated along with reasons**.

(c) Compliance/ acceptance to Paras 5 and 6 at Part-I above are to be clearly indicated and certified in response. Any other relevant additional literature or document on the Barges can also be attached with the RFI response form.

(d) The duly filled RFI response should be dispatched to the under mentioned address: -

Directorate of Ship Production
Naval Headquarters
Ministry of Defence
Room No. E-201, 2nd Floor
Nausena Bhawan
Delhi Cantt, New Delhi-110010
Tele: 011-28702425
E-mail: dsp@navy.gov.in

(e) Last date of acceptance of filled RFI response is _____ (08 weeks from uploading of RFI). The Shipyards short listed for issuance of RFP would be intimated based on Technical Capacity Assessment as per Appendix C to Chapter XII of DAP 20.

(f) Shipyards, if required, can communicate to the Project Officer of DSP with below mentioned contact details for seeking clarification/ information on the documents (such as Navy Order (NO), Naval Construction Document (NCD), etc.) mentioned in this document: -

Directorate of Ship Production
Naval Headquarters
Ministry of Defence
Room No. E-201, 2nd Floor
Nausena Bhawan
Delhi Cantt, New Delhi-110010
Tele: 011-28702425
E-mail: dsp@navy.gov.in

8. The Government of India invites responses to this request from registered Indian Shipyards who qualify the criteria/ willing to meet the criteria as enumerated below: -

(a) Financial Assessment Parameters as per **Annexure II** to **Appendix C** to **Chapter XII** of **DAP 20**.

(b) The shipyard should have been qualified by Technical Capacity Assessment as per **Annexure I** to **Appendix C** to **Chapter XII** of **DAP 20** or willing to be assessed as per the aforesaid technical capacity assessment parameters.

9. The end user of 06 X LCU MK V is the Indian Navy.

10. Shipyard to submit information with respect to utilisation of Indigenous Military Material and Software, indicating the plan for material sourcing and cost implications vis-a-vis foreign sourcing of materials, iaw Paras 11 and 13 of Chapter II of DAP-20, if applicable.

11. This information is being issued with no financial commitment and the Ministry of Defense reserves the right to change or vary any part thereof at any stage. The Government of India also reserves the right to withdraw it, should it be so necessary at any stage. The acquisition process would be carried out under the provisions of DAP 20.

PART- III

Guidelines for Framing Criteria for Vendor Selection/ Prequalification in respect of 06 X LCU MK V under Buy (Indian-IDDM) Category

12. The guidelines prescribed for short-listing/ pre-qualification of Indian vendors in case of shipbuilding cases are detailed in **Chapter XII** of **DAP 20** and Financial Assessment Parameters as per **Annexure II** to **Appendix C** to **Chapter XII** of **DAP 20**. The relevant details are placed at **Appendix D**.

13. **SME/ MSME/ Startup Certification**. Shipyard to provide certificate/relevant documents of being a SME, MSME or Startup, if applicable.

Appendix A
(Refers to Para 5 of RFI)

OPERATIONAL / TECHNICAL SPECIFICATIONS
FOR 06 X LCU MK V

	SECTION A - GENERAL	
1	**Role**	**Primary** 1.1 Amphibious Operations. 1.2 To transport, deploy and recover troops and equipment from ship to shore and vice-versa. 1.3 SLOC monitoring and EEZ Patrol. **Secondary** 1.4 HADR Operations. 1.5 Supply/ replenishment tasks and logistics support for island territories. 1.6 Search and Rescue Operations. 1.7 The ship shall be able to carry out beaching in gradients steeper than 1:40.
2	**Special Features for Amphibious Operation**	Bow Door arrangement with breadth > 5 m and height > 3.8 m Gradual ramp slope for easy embarkation and disembarkation Maximised pay load capacity to be not less than 04 x MBTs and 04 x BMPs *or* 10 x Type B vehicles Covered/enclosed hold of dimensions as follows:- 2.1 Length > 42 m 2.2 Breadth > 5.5 m 2.3 Clear height at centreline > 3.6 m

		Vehicle Ramp on weather deck of dimensions as follows:- 2.4 Length > 15 m 2.5 Breadth > 4.6 m Person carrying capacity:- 2.6 Officers > 05 2.7 Troops > 190
3	**Critical Design Drivers**	3.1 Special features for Amphibious Operations. 3.2 Payload carrying capacity with minimal draught. 3.3 Automation for minimally manned operations. 3.4 Capability of stand-off beaching operations and expeditious launch and recovery through bow door.
4	**Area of Operations**	Should be capable of operating in Indian Ocean Region (IOR)
5	**Rules and Regulations**	The international conventions and regulations (as listed below) and as applicable to such warships are to be ensured. The rules and regulations should be duly amended in the contract as applicable to include those in force on the date of keel laying:- 5.1 International Convention for Safety of Life at Sea (SOLAS) as updated from time to time. 5.2 1972 International Convention for Prevention of Collision at Sea as updated from time to time. 5.3 International Convention for Prevention of Pollution from Ships (MARPOL), as per latest amendments along with latest IMO/MEPC Regulations in vogue for sewage treatment, galley waste, garbage disposal, etc. 5.4 ICOS (IMO- International Code of Signals). 5.5 Def Stan 02-102 – Ventilation and Air Treatment of Galleys and Pantries with cooking appliances.

		5.6 Effluent/ emission treatment for overboard, underwater and funnel discharges, commensurate with the International Convention for Prevention of Pollution from ships 1973, Protocol 1978. 5.7 Rules of Navigation and Tonnage Regulations for Suez and Panama Canal Authorities, including Measurement. 5.8 International Convention on Load Lines, 1966 and the International Convention on Tonnage Measurement. 5.9 Stability Growth Margin is to be *iaw* with Def Stan 02-900 Part 4 Issue 1 at full rates applicable to Combatants for a period of 10 years. 5.10 Stability Standard both intact and damaged to be *iaw* Def Stan 02-900 Part 4 Issue 1. Inclining experiment is to be undertaken *iaw* NCD 0104 and stability booklet is to be prepared *iaw* NCD 0106. 5.11 The ship is to be built as per *IN* design requirement over and above requirements of international conventions/ standards mentioned.
6	**Mission Duration**	Approx. 30 Days
7	**Displacement**	Approx. 1500 + 15% Tons
8	**Dimensions (Approx)**	8.1 Length overall 85 m (approx) + 5% **8.2 Beam commensurate with displacement and requirement for amphibious operations** 8.3 Draught in combat loading conditions not exceeding 2.5 m (Fwd) and 2.67 m (Aft) to support beaching in gradient steeper than 1:40**.** Propellers to be above the keel line.
9	**Speed**	9.1 Maximum speed of not less than 15 kt at 85% MCR conditions at ambient temperatures of 40 deg C, in the fully laden condition upto Sea State 3 and while less than six months out of dock. 9.2 Economical speed of > 12 kt
10	**Endurance**	Approx. 4500 nm at economical speed

<table>
<tr><td>11</td><td>Sea Worthiness</td><td>11.1 Operations up to Sea State 3.

11.2 Transit at all headings up to Sea State 5.

11.2 Transit at best heading upto Sea State 6.

11.4 Survival upto Sea State 7.</td></tr>
<tr><td>12</td><td>Propulsion</td><td>Based on diesel main engines</td></tr>
<tr><td>13</td><td>Operating Conditions</td><td>13.1 Operating Profile. The broad operating profile of the ship shall be:-

<table>
<tr><th>Ser</th><th>Speed Regime (Kn)</th><th>Time (%)</th></tr>
<tr><td>13.1.1</td><td>0 - 8</td><td>30</td></tr>
<tr><td>13.1.2</td><td>9 - 15</td><td>50</td></tr>
<tr><td>13.1.3</td><td>Above 15</td><td>20</td></tr>
</table>

13.2 The ship should be available for deployment at 4 hours normal notice and 30 minutes short notice.

13.3 Normal, Quiet and Ultra Quiet regimes for various conditions of operation.

13.4 The ship should be capable of operating under the following environmental conditions:-

13.4.1 Ambient Air Temperature. - 1 ºC to 55 ºC

13.4.2 Max Relative Humidity. 95 % at 32 ºC

13.4.3 Ambient Sea Water Temp. max 35 ºC

13.4.4 Salinity of Water. Upto 36000 PPM.</td></tr>
<tr><td>14</td><td>Complement</td><td>Ship’s crew of approx. 81 (06 officers + 75 sailors) including accommodation for 30% women (as officers) and 20% women (as sailors) shall be catered</td></tr>
<tr><td>15</td><td>Military Lift</td><td>Capable of carrying at least 04 MBTs & at least 04 BMPs & 190 troops and 05</td></tr>
</table>

		officers over and above ships complement OR Capable of carrying at least 04 MBTs, at least 04 Type B Vehicles & 190 troops and 05 officers OR Capable of carrying ≥ 10 Type B Vehicles & 190 troops and 05 officers over and above ships complement OR Capable of carrying 05 BMPs & at least 04 Type B & 190 troops and 05 officers Vehicles.
16	**Boats**	16.1 Provision to two 7 m RHB capable of being launched/ recovered at ship speed of upto 6 kn and each shall be serviced by a davit. 16.2 Capacity to carry four Geminis serviced by an electrically operated lowering and hoisting mechanism.
17	**IPMS**	An Integrated Platform Management System (IPMS) including Battle Damage Control System (BDCS) shall be provided. The Ship Control Centre (SCC) should have consoles for control and monitoring of main propulsion system, auxiliaries, PGD and BDCS.
18	**General Remarks**	18.1 Planned ship life of at least 30 years. 18.2 Ships shall have an OCRC of at least 60 months. Maintenance period would include NR of 06 months and MR of 08 months duration. Every alternate NR would be an MR. 18.3 All machinery, weapons, sensors and equipment should have maximum reliability and maintainability for a minimum mission time of upto 4 weeks. 18.4 Growth potential shall cater for 0.65% per annum increase in basic ship displacement and 0.40% per annum increase in KG as per NES 109 Issue 1, 01 Apr 2000.

		18.5 Should conform to current MARPOL regulations
19	**Commercial-off-the-shelf (COTS) Technology**	COTS technology shall be incorporated *iaw* extant orders in force.
20	**Shock Protection**	Shock protection *iaw IN* Shock Policy EG/POLICY/TSV/12/23 dated 31 Jan 23, MIL STD 740-2 (SBN), MIL STD 1474E (ABN), ISO 10816 (Vibrations).
21	**Ergonomics**	21.1 Access arrangement and consequent design shall comply with Def Stan 02-119, Def Stan 02-149, Def Stan 02-127 and NES 149 or its latest version. 21.2 Human factor consideration iaw DEFSTAN 00-25 or its latest version.
22	**Construction Material**	DMR 249A steel *iaw* NCD 0249
23	**Construction**	Construction should be based on modern concepts like Integrated Construction of Hull, and Integrated Composite Mast. Concept of Digital Twin, ie product Data Management (PDM) and Product Life Cycle management (PLM) are to be utilized for effective management of information throughout life cycle of the ship.
24	**Classification**	Ship shall be built as per Naval Standards and Naval Ship rules of a classification society approved by ***IN*** for construction and classification of combatants.
25	**Surveillance and Security Arrangement**	25.1 Contemporary Internal/ External Security and Safety Surveillance System (CCTV System), as per extant policy 25.2 IPMS CCTV camera system as per SOTRs
26	**Automation and Redundancy**	Shall be configured as smart ships with great degree of automation and inbuilt redundancy.
27	**Workshops**	In order to optimize available space onboard, various Workshops/ Laboratories, as specified in later sections, are to be co-located based on their utility to the extant feasible.

SECTION B - HULL

1. **Standards**

1.1. Naval Standards.

1.2. Naval ship rules of a Classification Society approved by ***IN*** for construction and classification of combatants.

1.3. IMO regulations (ILLC, MARPOL, SOLAS, etc.).

1.4. ISO 5488:1979 and IS 10493.

2. **Whole Ship Features**

2.1. Hydrodynamic analyses and model testing *iaw* NCD 0102.

2.2. Watertight boundaries *iaw* NES 119 and DefStan 02-900, Part IV, Issue1.

2.3. Ventilation system design (except machinery spaces) *iaw* NCD 1903.

2.4. Accommodation and working space design *iaw* NHQ Guideline Specifications and Class rules (notation-specific).

2.5. Noise, illumination and internal environment in accommodation and working spaces *iaw* Class rules (notation-specific).

2.6. Stability criteria *iaw* DefStan 02-900 Part 4 Issue 1.

2.7. Stability growth margins *iaw* DefStan 02-900 Part 4 Issue 1.

2.8. In-water Survey compliant.

2.9. Fire-zoning *iaw* NES 119.

2.10. Structural fire protection *iaw* Class rules and SOLAS.

2.11. Access fittings *iaw* NES 127.

3. **Suggested Systems**

Ser	Name	Indicative Number	Standards
3.1	Paint Scheme	NA	NCDs 1437, 1481, 1485, 1491, 1493, 1494, 1437, 1478, 1485, NO and latest NHQ policy on painting
3.2	Deck Covering	NA	NCD 3717 and latest NHQ policy

3.3	DMR249A Steel	As per design	NCD 0249
3.4	Ventilation (Except Machinery Spaces)	NA	NCD 1903 and latest NHQ policy
3.5	Sewage System	As per design	NCD 3930, DefStan 02-718 and latest NHQ policy
3.6	Drainage System	As per design	DefStan 02-718
3.7	Scupper and Discharge System	As per design	DefStan 02-718, DefStan 02-900
3.8	Doors, Hatches and EES	As per design	NCDs 1447, 1448, 1449 & 5910, and latest NHQ policy
3.9	Means of access	As per design	NCD 0107 and latest NHQ policy
3.10	Bow Ramp	01	-
3.11	ICCP system	As per design	NCD 3922 and latest NHQ policy

4. **Suggested Equipment**

Ser	**Name**	**Indicative Number**	**Standards**
4.1	ATUs	As per design	NCD 1903 and latest NHQ policy
4.2	STPs	02 (or as per design)	NCD 3930 and latest NHQ policy
4.3	Anchor Capstans	04	NCD 3901 and latest NHQ policy
4.4	Anchors, chain cable and accessories	04	NCD 3909, BR 67 and latest NHQ policy
4.5	Tank hauling Capstan	01	NCD 3901 and latest NHQ policy
4.6	Rudders	02	DefStan 02-155
4.7	Cranes	02	
4.8	Accommodation Ladders	01	ISO 5488:1979, IS 10493, BR 67, INBR 1552 and SOLAS
4.9	Deck Equipment for Aircraft	As per capability of ship to undertake VERTREP	
4.10	7 m RHBs	02	NCD 4012 and latest NHQ policy
4.11	Davits for 7 m RHBs	02	NCD 1500 and latest NHQ policy
4.12	Gemini Craft with electrically operated hoisting and lowering mechanism	04	Latest NHQ Policy

4.13	Food Lift	01	Class Regulations on Shipboard Lifting Appliances and SOLAS and latest NHQ Policy.
4.14	Hull Workshop Equipment	As per NHQ guidelines	NHQ Guideline Specifications for standardisation of accommodation and hull compartments on Naval ships and latest NHQ policy
4.15	ICCP and Sacrificial anodes	As per design	NCDs 3922, 3908 and latest NHQ policy
4.16	Launch and Recovery System for Autonomous/ remotely operated vessels	01	Naval
4.17	Barber Equipment	As per NHQ guidelines	NHQ Guideline Specifications for standardisation of accommodation and hull compartments on Naval ships and latest NHQ policy
4.18	Tailor Equipment	01 set	COTS
4.19	Guard rails and stanchions	As per design	NCDs 5903 & 5905 and latest NHQ policy

5. **<u>Compartments</u>**

Ser	Name	Indicative Number	Standards
5.1	Hull Store	01	• DefStan 02-126 and 02-307 • NHQ Guideline Specifications for standardisation of accommodation and hull compartments on Naval ships • NHQ Guideline Specifications for habitability upgradation and modular accommodation works onboard Indian Naval Ships. Latest NHQ policy
5.2	Hull Workshop		
5.3	Hull Office	01	
5.4	STP Compartment(s)	02 (or as per design)	• NCD 3930, Issue 3 • Def Stan 02-102 • Def Stan 02-718 Latest NHQ policy
5.5	Baggage Store	01	• Def Stan 02-126 • NHQ Guideline Specifications for standardisation of accommodation and hull compartments on Naval ships Latest NHQ policy
5.6	Barber Shop	01	

5.7	Tailor's shop	01	• NHQ Guideline Specifications for standardisation of accommodation and hull compartments on Naval ships • NHQ Guideline Specifications for habitability upgradation and modular accommodation works onboard Indian Naval Ships. Latest NHQ policy
5.8	Canteen	01 (with combined or attached canteen store)	• NHQ Guideline Specifications for habitability upgradation and modular accommodation works onboard Indian Naval Ships. • Def Stan 02-126 Latest NHQ policy
5.9	Fuel Tanks	As per design	• DefStan 02-154, • DefStan 02-155 INBR 31
5.10	Fresh Water Tanks	As per design	• DefStan 02-154, • DefStan 02-155 INBR 31
5.11	Laundry	01	• Def Stan 02-123 • NHQ Guideline Specifications for standardisation of accommodation and hull compartments on Naval ships Latest NHQ policy
5.12	Gears for Taking Fuel	As per design	• DefStan 07-279 • DefStan 22-94. • BR 67 • Latest NHQ policy
5.13	Underwater Openings	As per design	-

SECTION C – ND & CMS

1. **Suggested Systems**

Ser	Name	Indicative Numbers	Standards
1.1	IBS	01	International and Naval Standards
1.2	CMS	01	Naval Standards
1.3	NAURAN Synthetic Fleet Trainer	01	Naval Standards

2. **Suggested Equipment**

Ser	Name	Indicative Numbers	Standards
2.1	Dual Channel Echo Sounder	01	iaw NHQ/DSR policy PP-06/2024/SB-I/NEFP dated 13 May 24 or latest.
2.2	Log	01	iaw NHQ/DSR policy PP-06/2024/SB-I/NEFP dated 13 May 24 or latest.
2.3	AIS	02	iaw NHQ/DSR policy PP-06/2024/SB-I/NEFP dated 13 May 24 or latest.
2.4	GNSS (G3I) NaVIC (RS) Code receiver	02	iaw VCNS memo P-07/22 dated 27 Oct 22 and NHQ/DSR policy PP-06/2024/SB-I/NEFP dated 13 May 24 or latest.
2.5	IFF Mk XII (S/A)	01	International Standard
2.6	Type I Gyro	02	iaw VCNS Memo P07/22 dated M27 Oct 22 and NHQ/DSR policy PP-06/2024/SB-I/NEFP dated 13 May 24 or latest.
2.7	Gyro Repeaters	As per Design	iaw VCNS memo P-07/22 dated 27 Oct 22 or latest and NHQ/DSR policy PP-06/2024/SB-I/NEFP dated 13 May 24.
2.8	Magnetic Compass	01	iaw QRs and NHQ policy letter WP/0604 dated 11 Mar 21 and NHQ/DSR policy PP-06/2024/SB-I/NEFP dated 13 May 24 or latest.
2.9	ADS-B	01	International Standards and NHQ/DSR policy PP-06/2024/SB-I/NEFP dated 13 May 24 or latest
2.10	Steering Consoles	03	iaw NHQ/DSR policy letter WP/0215/ Ops Room dated 30 Jul 21
2.11	Night Vision Binoculars	05	iaw NHQ /DSR policy WP/ 0651/ NVD dated 31 Aug 15.
2.12	WSDS/ WSDI	01	Mil Std

3. **Compartments**

Ser	Name	Indicative Numbers	Standards
3.1	Bridge	01	3.1.1 Naval Regulation 3.1.2 NHQ/DSR policy PP-06/2024/SB-I/NEFP dated 13 May 24 or latest. 3.1.3 NHQ/DSR policy PP-07/2023/SB-I/Bridge Layout dated 18 Dec 23 or latest. 3.1.4 NHQ/DSR policy 06/2023/SB-I/IC dated 11 Sep 23
3.2	Ops Room	01	3.2.1 *Iaw* NHQ Policy WP/0215/Ops Room on Guidelines of Ops Room dated 30 Jul 21

			3.2.2 NHQ/DSR policy PP-10/2022/SB-I/CMS dated 20 Dec 22 or latest 3.2.3 NHQ/DSR policy 06/2023/SB-I/IC dated 11 Sep 23
3.3	Emergency Conning Position (ECP)	01	3.3.1 *Iaw* NHQ policy letter WP/0604 dated 11 Mar 21. 3.3.2 Provision akin to bridge lighting, where ECP is designed as an internal compartment. 3.3.3 Suitable lighting arrangement for plotting table and conning. 3.3.4 AELs *iaw* EED-50-28 for enclosed ECP.
3.4	Chart House	01	NHQ/DSR policy PP-06/2024/SB-I/NEFP dated 13 May 24 or latest.

SECTION D - GUNNERY

1. **Standards**. Naval

2. **Suggested Systems and Equipment**

Ser	Name	Indicative Numbers	Standards
2.1	02 x AK 630 with EOFCS	02	Naval
2.2	12.7 mm SRCG	02	Naval
2.3	EOIRST	01	Naval
2.4	VSHORADS	01	Naval
2.5	Kavach Mod II or latest upgrade	02 x SR	Naval
2.6	Ship Weapon Interlock Safety System (SWISS)	01	Naval
2.7	COMS	01	Naval
2.8	LM (SR)	01	Naval
2.9	Small Arms	As per allowance promulgated by NHQ. Small Arms Posts and Check Fire Bell arrangement should conform to the latest policy guidelines issued by NHQ/ DSR.	
2.10	LRAD/AWD	02 x LRAD/ AWD	
2.11	Saluting Guns	x Portable Saluting Guns	

3. **Compartments**.

3.1 Weapon compartments as per NSQRs and equipment binding data.

3.2 Magazines for weapons are to be provided for stowage of ammunition and are to conform to INMER. Following magazines envisaged:-

3.2.1 30 mm magazine

3.2.2 04 x VSHORADS Bunkers

3.2.3 LM Magazine for > 10 LM (SR)

3.2.4 Chaff Magazine

3.2.5 Small arms magazine

3.2.6 Troops ammunition magazine for storage of ammunition for 01 company. It would include 02 x MMGs, 02 x AGLs, 08 x LMGs, 08 x Rocket launchers and 82 rifles including 04 sniper rifles.

3.2.7 Magazine for stowage of DC Mk XI for aviation use.

3.3 Ready Use lockers are to be provided as per latest specifications laid down by NHQ/ DSR. Gun Wharf/ VBSS Gear Store is to be provided. Armoury for small arms iaw NHQ guidelines and INMER. Pyrotechnic locker and scare charge/hand grenade locker are to be provided *iaw* NHQ guidelines and INMER.

3.4 Magazines should be fitted with CCTV/ surveillance arrangements and audio alarm systems for access control iaw latest NHQ/ DSR policy guidelines.

3.5 The ship should be provided with CCTV coverage consisting of fixed or Pan, Tilt, Zoom (PTZ) camera, suitable multi-functional displays, joy stick control and record and replay functions for external surveillance (including gangway), internal surveillance, monitoring underwater and sensitive compartments, alleyways, magazines and armouries and for monitoring aircraft operations. The CCTV and Security system should be integrated with the ship's CMS and conform to the guidelines issued by NHQ/DSR.

3.6 01 Gunnery Office

SECTION E - ASW

1. **Standards**. Naval

2. **Suggested Systems and Equipment**

Ser	Name	Indicative Numbers	Standards
2.1	Expendable bathy thermograph (XBT)	01	Naval Standards

3. **Compartments**

Ser	Name	Indicative Number	Standards
3.1	Magazine for demolition store and small arms ammunition	01	As per INMER
3.2	ASW Store	01	As per INMER
3.3	Autonomous System Compartment	01	Naval
3.4	Detonator Locker	01	As per INMER
3.5	RU locker for HG & SC	01	As per INMER
3.6	ASW Office	01	Naval

SECTION F - SEAMANSHIP

1. **Suggested Systems.**

Ser	Name	Indicative Number	Standards
1.1	Towing arrangement	Two (Fwd and Aft Towing Arrangement)	1.1.1 As per NATO standards. 1.1.2 As per latest edition of DEFSTAN 07-279, DEFSTAN 22-90 and DEFSTAN 22-94. BR 67/2018
1.2	Stern Fuelling	One set of stern fuelling gear	
1.3	Light Jackstay Reception Point	Two points (one on each side for light Jackstay)one set of jackstay gear	1.3.1 DEFSTAN 07-279, DEFSTAN 22-94. 1.3.2 BR 67/2018
1.4	Light Line Transfer (LLT)	One set of gears for LLT	1.4.1 BR 67/2018 1.4.2 INSI 03/2013
1.5	VERTREP	For forward and Aft part of Ship.	Naval Standards
1.6	Anchors and Berthing	03 Anchors are to be provided as per ***IN*** design requirements	Anchor chain cable and accessories should be iaw latest version of NCD 3909 and 3914. BR 67/2018.

2. **Suggested Equipment.**

Ser	Name	Indicative Number	Standards
2.1	Brow/ Gangway	Two	Naval Standards
2.2	Boats	2.2.1 02 x 7m RHB 2.2.2 04 x Gemini	Naval Standards
2.3	Shades and Covers	2.3.1 Two sets of PVC coated nylon fabric retractable shade are to be provided for gangway area. 2.3.2 Two sets of lightweight canvas waterproof cover for weather deck spaces/ weather deck fitting/ machinery openings as per modern merchant marine standards, along with rigging arrangement, are to be provided.	NA
2.4	Hoisting/ Lifting Gear	As per design	Naval Standards
2.5	Life Saving equipment	2.5.1 Life rafts (catering for 140% Manning Plan iaw DSR Policy WP/0702/Life raft/Policy dated 21 Oct 21) 2.5.2 Hazardous Duty Life Jackets (HDLJ) iaw DSR Policy letter WP/0702/HDLJ dated 29 Jul 15. 2.5.3 General Service Life Jackets. GSLJs for 145% of Manning Plan iaw DSR WP/0702/GSLJ/	Lifesaving eqpt are to comply with latest NHQ Policy guidelines in force. Conforming to latest IMO/SOLAS LSA code. As per specifications laid down in latest version of NCD 3926. Conforming to latest version of NCD 3925. Iaw Para 06036 of BR 67/2018 (Admiralty Manual of Seamanship)

		Policy dated 24 Mar 21. 2.5.4 Lifebuoys as per scale. 2.5.5 08 MOB Light and Smoke Markers along with Lifebuoys. 2.5.6 Two way Lifebuoy Alarm. 2.5.7 Two BPSPL (Battery Powered Self Propelled Lifebuoy) 2.5.8 02 x Life saver	
2.6	Berthing gears and fittings	2.6.1 Adequate numbers of thin line berthing hawsers of suitable size should be provided as per *IN* design requirement 2.6.2 In addition, adequate numbers of bollards, cleats and fairleads of suitable strength are to be provided.	iaw Art 3077 of BR 67/2018.
2.7	Seamanship Equipment	Seamanship gear including emergency gears to be provided as per BR 67 for undertaking anchoring, towing, mooring, abeam/ astern fuelling, light jackstay, light line transfer and boat operations.	Naval Standards
2.8	Safety Equipment	To be provided as per latest *IN* policy.	As per latest ***IN*** policy. BR 67/2018
2.9	Beach Survey Equipment	02 x Takshak	Naval Standards

3. **Compartments**

Ser	Name	Indicative Numbers	Standards
3.1	Paint Store	01	3.1.1 Preferably located forward and above Damage Control Deck. 3.1.2 Effective ventilation is to be provided in paint store with mechanical exhaust system with either natural or mechanical supply. 3.1.3 Sufficient flame proof lighting equipment is to be provided. 3.1.4 Paint store is to be fitted with dedicated major/ fixed automatic/ remote/ manual firefighting systems, which are to be in an operational state at all time. 3.1.5 Smoke/ heat sensors are to be fitted inside the paint store. 3.1.6 Portable firefighting system (one 9 ltr AFFF and 2 Kg CO_2 extinguisher is to be fitted inside the paint store near to the door). 3.1.7 Two 9 ltr AFFF extinguishers, one 2 kg CO_2 extinguisher and one fire hydrant fitted in paint store lobby.
3.2	Boatswain Store	01	3.2.1 Preferably located forward and above Damage Control Deck. 3.2.2 Effective ventilation is to be provided in Boatswain store with mechanical exhaust system with either natural or mechanical supply. 3.2.3 Sufficient flame proof lighting equipment is to be provided. 3.2.4 Boatswain store is to be fitted with dedicated major/ fixed automatic/ remote/ manual firefighting systems. 3.2.5 Smoke/ heat sensors are to be fitted inside the Boatswain store. 3.2.6 Portable firefighting system (one 9 ltr AFFF and 2 Kg CO_2 extinguisher is to be

			fitted inside the Boatswain store near to the door).
3.3	Reel Store	02	3.3.1 Preferably located one each at forward and aft and above Damage Control Deck. 3.3.2 Effective ventilation is to be provided in Reel store with mechanical exhaust system with either natural or mechanical supply. 3.3.3 Sufficient racks with securing arrangement to be provided. 3.3.4 Ladders to be provided for getting access to the top racks. 3.3.5 Sufficient cleats/ hooks to be provided on bulkhead for securing of small cordages. 3.3.6 Reel store is to be fitted with dedicated fixed automatic/ remote/ manual firefighting systems, which are to be in an operational state at all time. 3.3.7 Smoke sensors are to be fitted inside the Reel store. 3.3.8 Portable fire fighting system (one 9 ltr AFFF and 2 Kg CO_2 extinguisher is to be fitted inside the Reel store near to the door).
3.4	RAS store	01	3.4.1 RAS Store as far as possible is to be located near RAS deck. 3.4.2 Effective ventilation is to be provided in RAS store with mechanical exhaust system with either natural or mechanical supply. 3.4.3 RAS store is to be fitted with dedicated fixed automatic/ remote/ manual firefighting systems, which are to be in an operational state at all time. 3.4.4 Smoke/ heat sensors are to be fitted inside the RAS store.

			3.4.5 Portable fire fighting system (one 9 ltr AFFF and 2 Kg CO_2 extinguisher is to be fitted inside the RAS store near to the door).

SECTION G – COMMUNICATION AND EW

1. **Suggested Systems**

Ser	Name	Indicative Numbers	Standards
1.1	Advanced Composite Communication System (ACCS)	01	MIL-STD
1.2	ESM system (as nominated by ***IN***)	01	MIL-STD
1.3	ECGNSS Jammer	01	MIL-STD

2. **Suggested Equipment**

Ser	Name	Indicative Numbers	Standards
2.1	ACCS (as nominated by IN).	Qty as per DNS Note CM/0331 dated 26 Apr 22 for class of ship	MIL-STD
2.2	HF Manpack (as nominated by ***IN***).	01	MIL-STD
2.3	On/Off line encryption System (latest version)	01	MIL-STD
2.4	Encryption device for internal communication	01	MIL-STD
2.5	Offline encryption System (latest version)	01	MIL-STD
2.6	Sanchar PC 2.0 with printer	01	COTS
2.7	IBA PC with printer and UPS	02	COTS
2.8	Crypto PC	02	COTS
2.9	EW PC	02	COTS
2.10	CB Safe (Big) with Physical Keys	02	COTS
2.11	Fire Proof Safes with two physical keys	04	COTS
2.12	GMDSS Equipment	iaw NHQ/ DNS CM/0337 dated 12 Nov 13.	COTS
2.13	Rukmani SSST (as nominated by ***IN***)	01	MIL- STD
2.14	IP Encryptor for SSST (as nominated by ***IN***)	02	MIL- STD
2.15	UHF SATCOM Terminal (as nominated by *IN*)	01	MIL- STD
2.16	MSS Tx-Rx Terminal (as nominated by ***IN***)	02	MIL- STD
2.17	Online Encryptor for MSS Terminal (as nominated by ***IN***)	04	MIL- STD

2.18	ISAT Phone	01	COTS
2.19	INMARSAT L-band Terminal (as nominated by *IN*) INMARSAT Ka-Band Terminal (as nominated by ***IN***)	01	COTS
2.20	IP encryptor for internet facing node (as nominated by ***IN***)	02	MIL- STD
2.21	Light Weight ESM cum COMINT system (as nominated by ***IN***)	01	BNE (CAT 'A')
2.22	Integrated Mast	01	BNE
2.23	Emergency Power Supply	01	-
2.24	Visual Signaling Equipment 02 x Signal Projector 02 x Aldis Lamp 02 x Flag sets 02 x Flag Lockers (with provision for vertical stowage of flags) 02 x Sets of Dressing Lines 02 x Sets Hand Signaling Torch 02 x Sets of RAS/ NUC Lights and Shapes) 02 x each Cross-Flag stand for Gangway & table		COTS
2.25	Office Equipment (02 x Office Computers with printers and UPS 01 x Desk Top Scanner with OCR 01 x Photocopier, 01x Heavy duty shredding machine 01 x Fax machine 01 x Cross cut shredding machine.		COTS
2.26	Emergency DA		Emergency DA for communication equipment *iaw* details at Sub-para 2(c) of Electrical section

3. **<u>Compartments</u>**

Ser	**Name**	**Indicative Numbers**	**Standards**
3.1	MCO	01	-
3.2	EW Post with in Ops room	01	-
3.3	V/ UHF Room	01	-
3.4	Flag Deck	01	-
3.5	Mast	01	-
3.6	CB Office	01	Naval

<u>SECTION H - NBCD</u>

1. **Standards**. Naval

2. **Suggested Systems**

Ser	Name	Indicative Numbers	Standards
2.1	Magazine Fire Fighting System	For all Magazines	SOTR–NB/0695/ Indigenous MFFS dated 18 May 16
2.2	Galley firefighting system	02	SOTR-NB/0695/GFSS (ii) dated 10 Oct 16
2.3	Fixed Fire Fighting System	01 each	DNBCD letter NB/0695/ FFFS dated 24 May 24
2.4	Addressable Fire Detection System (AFDS)	01	NHQ/DEE Policy EE/ Policy/L-74 POWER-21 dated 21 Feb 11 DNBCD Policy letter NB/0695/AFDS dated 19 Jan 18 SOTR-EED-50-23 dated 21 Feb 11
2.5	Addressable Flood Alarm System (AFAS)	01	NHQ/ DEE Policy letter EE/Policy/L-84/POWER-27 dated 02 Apr 12 DNBCD Policy letter NB/0695/AFAS dated 24 Aug 21 SOTR- EED-50-25(R1) dated 02 Apr 12.
2.6	Smoke Clearance System	01	Para 0203 of INBR 312
2.7	Section Foam FF System	01 per section/ machinery compts	AR-AFFF SOLAS MED/ UL Listed/ DNV/ EN Certified
2.8	BDCS	04	Chapter XI of INBR 312 and para 33 of NO (Str) 03/19

3. **Suggested Equipment**

Ser	Name	Indicative Numbers	Standards
3.1	Engine Driven Sea water Emergency Fire Pump	02	Para 0703 of INBR 312 SOTR- NB/0695/ indigenisation/ KS 01-version 02 dated 14 Nov14
3.2	Enclosed Breathing Apparatus (BA) Charging System	01	Para 205 9l) of INBR and DNBCD SOTRs SOTR- NB/0695/NEI/ enclosed BA Charging Panel dated 11 Sep 17
3.3	NBC Arrangements	01	As per Def Stan 02-118 (NES 118).
3.4	Ship Installed Radiac System (SIRS)	01	SOTR vide DEE EED-50-42 dated 12 Aug 13 INBR 1082 (l) (1) and INBR 312. SOTR-EED-50-42 dated Aug 13.
3.5	Biological Agent Detection System	01	
3.6	Ship Installed Chemical Agent Detection System (SICADS)	01	SOTR vide DNBCD NB/0695/ SICADS/R01 dated 09 Oct 24. SOTR- NB/0695/ SICADS/R01 dated 09 Oct 24.
3.7	NBCD Arrangements		
3.8	NBCD Communications Arrangements	01 Set	All communications requirements are to be provided as per para 0220 and 0310 of INBR 312.
3.9	Additional NBCD Features		3.9.1 As per para 0704(b)(i) of INBR 312. 3.9.2 As per NES 102. 3.9.3 As per para 0709 of INBR 312. 3.9.4 Para 0703 of INBR 312. 3.9.5 Information should be as per Appendix 'B' of NO 27/16. 3.9.6 As per para 0205(j) of INBR 312. 3.9.7 INBR 312 and NES 119.

			3.9.8 As per NCD 3930. 3.9.9 As per para 1119 of INBR 312. 3.9.10 As per para 1302 of INBR 1835 Vol II, INBR 312 and NHQ/ DNBCD Policy letter NB/0695/Policy dated 03 Jul 17. 3.9.11 As per para 0218(l) of INBR 312. 3.9.12 As per para 0227 of INBR 312. 3.9.13 As per Class.
3.10	Emergency DA	Emergency DA for communication equipment *iaw* details at Sub-para 2(c) of Electrical section	

4. **Compartments**. NBCD compartments *iaw* NHQ/DNBCD Policy NB/0695/ Standardisation dated 02 Feb 23.

Ser	Name	Indicative Numbers	Standards
4.1	SCC/DCHQ	01	As per para 34 of NO (Str) 03/19 and INBR 312
4.2	Alternate DCHQ	01	As per INBR 312 and 36 of NO (Str) 03/19
4.3	DC Post	02	As per INBR 312
4.4	NBCD Office	01	As per Para 0313 of INBR 312
4.5	NBCD lockers	As per design	INBR 1835 Vol II
4.6	NBCD Stores	02 (NBCD stores) + 01 (01 NBC Store)	As per Para 0222 (b) of INBR 312 As per Para 0222 (b) of INBR 312
4.7	BASCCA Charging Compt	As per design	Fixed enclosed BASCCA charging

SECTION J - ENGINEERING

1. **Standards**. Naval Standards viz. Navy Orders, DME Specifications, EED, NCD, Def Stan, MIL STD, *IN* Policy Letters etc. as specified against each serial of Paras below is to be adhered.

2. **Whole Ship Features**.

2.1 **Environmental Conditions**.

2.1.1 All machinery (other than AC Plants) are to be designed to perform at rated conditions under the following environmental conditions unless otherwise specified: -

Ambient Air Temperature : -10^0C to 45^0C

Max Relative Humidity : 95% at 35^0C.

Surface Sea Water Temperature : 1^0C to 35^0C.

2.1.2 The Air Conditioning Plant is to be designed to perform at rated conditions under the following environmental conditions iaw NCD 1903, Issue 1, Aug 22:-

Ambient Air Temperature : 41^0C Dry Bulb (Extreme Ambient Temperature - 45 ^{0}C)

Surface Sea Water Temperature : 38^0C.

2.1.3 All machinery, its sub-assemblies and control systems should be able to perform continuous operation with machinery compartment conditions as follows:-

Normal Operating Temperature : Upto 55^0C.

Operation in Closed Down Condition : > 70^0C.

2.2 **Propulsion System Integration**. A PSI study must be undertaken through independent PSI consultant having past experience of undertaking PSI study for Diesel Propulsion on a Warship.

2.3 **On Board Spares**. The ship is to be provided with OBS for all equipment for running hours based/ periodic maintenance routines likely to fall due in the ops cycle for a period of two years and also for undertaking repairs/ defect rectification on the equipment during this period.

2.4 **Base and Depot Spares**. B&D spares *iaw* INBR 622(Rev), for five years of exploitation based on Manufacturers Recommended List of Spares (MRLS) is to be provided.

2.5 **Shipping/ Unshipping**. Shipping/ Unshipping routes are to be well defined for all engineering equipment. Provision of soft patch for lowering/ removal of main propulsion and power generation equipment is to catered for. The shipment/ unshipping route for machinery should not affect the ship's structure. Guidelines as per Def Stan 02-302 and NHQ MoD/ DND Policy Letter CD/PSISG/400/TECH POLICY dated 04 Jul 17 are to be adhered to.

2.6 **Redundancy**. Redundancy as mentioned against each serial of the SR is to be catered in the system design and during the selection of equipment.

2.7 **POL**. Fuel specification is to be as per HFHSD promulgated vide ***IN*** DME 512. Only indigenous POLs supplied by ***IN*** POL supplier to be used on all engineering equipment.

2.8 **Material of Construction**. Material of Construction (MOC) of engineering equipment and system should be as per ***IN*** approved SOTR/ systems specifications.

2.9 **System Piping**. Press Fit/ Flangeless coupling may be used iaw NHQ MoD(N) letter EG/Policy/Aux/03/22 dated 11 Aug 22. Colour Coding of System pipes is to be iaw NHQ Policy letter EG/4001/AUX/10 dated 01 Nov 2018.

2.10 **Training**. Training on Engineering equipment operation and upto Level 3/ 4 maintenance is to be provided to the Ship's crew and Yard personnel.

2.11 **Shock Protection**. Shock protection of machinery shall be for Class I vessel in accordance with *IN* Shock Policy EG/POLICY/TSV/12/23 dated 31 Jan 23.

2.12 **Zoning**. Independent machinery and systems will be zoned as far as possible, within the same watertight section.

3. **<u>Suggested</u> <u>System</u>**

Ser	Name	Indicative Numbers	Standards
3.1	Integrated Platform Management System (IPMS)	One System	As per ***IN*** approved SOTR including major requirements viz. ***IN*** specification, ***IN*** Shock Policy, MIL STD 740-2 (SBN), MIL STD 1474E (ABN), ISO 10816 (Vibrations) etc.
3.2	NOVEC 1230	One System	As per ***IN*** approved SOTR including major requirements viz. ***IN*** specification, ***IN*** Shock Policy, MIL STD 740-2 (SBN), MIL STD 1474E (ABN), ISO 10816 (Vibrations) etc.
3.3	Fire Main System	As per design	As per Chapter VII of INBR 312
3.4	Salvage System	As per design	As per Chapter VII of INBR 312

3.5	Domestic Fresh Water System	As per design	Def Stan 02-728
3.6	Chilled Water System	As per design	Def Stan 02-102
3.7	Machinery Sea Water Cooling System	As per design	Def Stan 02-719
3.8	Air Intake and Exhaust System	As per design	Def Stan 02-309 Def Stan 02-313
3.9	Main Engine Fuel Oil System	As per design	Def Stan 02-320
3.10	Main Engine lub Oil System	As per design	Def Stan 02-303
3.11	Bilge Pump	02	Def Stan 02-327
3.12	HP and LP Compressed Air System	As per design	Def Stan 02-314
3.13	Anti Fouling and Anti Corrosion System	As per design	As per ***IN*** approved SOTR.

4. **<u>Suggested</u> <u>Equipment.</u>**

Ser	**Name**	**Indicative Number**	**Standards**
4.1	Main Diesel Engine	02	As per ***IN*** approved SOTR including major requirements viz. relevant DEF STAN 02-305, ***IN*** Shock Policy, MIL STD 740-2 (SBN), MIL STD 1474E (ABN), ISO 10816 (Vibrations)
4.2	Reduction Gearbox (RG)	02	As per ***IN*** approved SOTR including major requirements viz. relevant DEF STAN 02-305, ***IN*** Shock Policy, MIL STD 740-2 (SBN), MIL STD 1474E (ABN), ISO 10816 (Vibrations)
4.3	Shafting System	02	As per ***IN*** approved SOTR including major requirements viz. DEF STAN 02-304, *IN* Shock Policy, MIL STD 740-2 (SBN), MIL STD 1474E (ABN), ISO 10816 (Vibrations) etc.
4.4	Diesel Generators	As per Design	As per ***IN*** approved SOTR including major requirements viz. Def Stan 02-313, EED-Q-242(R3), Def Stan 02-329,

			NHQ MoD(N)/ DME policy letter EG/Policy/DSL/04/2015 dated 16 Apr 15 (only for high speed engines), ***IN*** Shock Policy, MIL STD 740-2 (SBN), MIL STD 1474E (ABN), ISO 10816 (Vibrations) etc.
4.5	Emergency DA	01	As per ***IN*** approved SOTR
4.6	Steering Gear	01	As per ***IN*** approved SOTR including major requirements viz. Def Stan 02-339, Def Stan 02-329, ***IN*** Shock Policy, MIL STD 740-2 (SBN), MIL STD 1474E (ABN), ISO 10816 (Vibrations) etc.
4.7	AC Plants (Semi Hermetic Screw Compressors)	03/As per Design	As per ***IN*** approved SOTR including major requirements viz. Def Stan 02-102 (Part 1), Issue 3 , Def Stan 02-329, ***IN*** Shock Policy, MIL STD 740-2 (SBN), MIL STD 1474E (ABN), ISO 10816 (Vibrations) etc.
4.8	Ref Plant	02	As per ***IN*** approved SOTR including major requirements viz. *IN* specification, Def Stan 02-159, ***IN*** Shock Policy, MIL STD 740-2 (SBN), MIL STD 1474E (ABN), ISO 10816 (Vibrations) etc.
4.9	Motor Driven High Pressure Air Compressor	02	As per *IN* approved SOTR including major requirements viz.*IN* specification, Def Stan 02-315, *IN* Shock Policy, MIL STD 740-2 (SBN), MIL STD 1474E (ABN), ISO 10816 (Vibrations) etc.
4.10	Diesel Driven High Pressure Air Compressor	01	As per ***IN*** approved SOTR including major requirements viz.*IN* specification, Def Stan 02-315, Def Stan 02-313 *IN* Shock Policy,

			MIL STD 740-2 (SBN), MIL STD 1474E (ABN), ISO 10816 (Vibrations) etc.
4.11	Reverse Osmosis Plants	02	As per *IN* approved SOTR including major requirements viz. *IN* Specifications, *IN* Shock Policy, MIL STD 740-2 (SBN), MIL STD 1474E (ABN), ISO 10816 (Vibrations) etc.
4.12	Centrifugal Pumps	As required	As per *IN* approved SOTR including major requirements viz. DME 465, *IN* Shock Policy, MIL STD 740-2 (SBN), MIL STD 1474E (ABN), ISO 10816 (Vibrations) etc.
4.13	Positive Displacement Pumps	As required	As per *IN* approved SOTR including major requirements viz. ISO 14847:1999, *IN* specification, *IN* Shock Policy, MIL STD 740-2 (SBN), MIL STD 1474E (ABN), ISO 10816 (Vibrations) etc.
4.14	Fuel Oil and Lub Oil Separator	Two each	As per *IN* approved SOTR including major requirements viz.*IN* specification, Def Stan 02-323, *IN* Shock Policy, MIL STD 740-2 (SBN), MIL STD 1474E (ABN), ISO 10816 (Vibrations) etc.
4.15	Oily Water Separator	01	As per *IN* approved SOTR including major requirements viz.*IN* specification, Def Stan 02-322, *IN* Shock Policy, MIL STD 740-2 (SBN), MIL STD 1474E (ABN), ISO 10816 (Vibrations) etc.

5. **<u>Compartments.</u>**

Ser	**Name**	**Indicative Number**	**Standards**
5.1	MCR	One	-
5.2	Engineering Office	One	-
5.3	Engine Rooms (Diesel Engine, Reduction Gear,	As required	NES 302 Def Stan 02-350 DME 464 EED-50-33

	and associated ancillaries)		
5.4	DA Compartment	As per ship design	NES 302 Def Stan 02-350 DME 464 EED-50-33
5.5	AC Compartment	As per ship design	NES 302 Def Stan 02-350 DME 464 EED-50-33
5.6	Pump Rooms	As per ship design	NES 302 Def Stan 02-350 DME 464 EED-50-33
5.7	Refrigeration Compartment	As per ship design	NES 302 Def Stan 02-350 DME 464 EED-50-33
5.8	ASP	As per ship design	NES 302 Def Stan 02-350 DME 464 EED-50-33
5.9	Shaft Spaces	As per ship design	NES 302 Def Stan 02-350 DME 464 EED-50-33
5.10	Emergency DA Compartment	As per ship design	NES 302 Def Stan 02-350 DME 464 EED-50-33
5.11	Engineering Stores	Two	-
5.12	Engineering RU Store	One	-
5.13	Engineering Controls & SPTA Store	One	-
5.14	Engineering Workshop	One	Def Stan 02-307
5.15	Engineering Control Lab	One	-
5.16	POL Drum Store	One	-
5.17	Engineering & POL Lab	One	-
5.18	Engineering Hose Compartment	One	-

SECTION K – ELECTRICAL

1. **Standards**. Naval Standards

2. **Suggested Systems.**

Ser	Name	Indicative Number	Standards
2.1	Power Generation	TBC	EED-Q-242 (R3)
2.2	Shore Supply Connection Box	Two	EED-Q-264
2.3	Emergency DA	One	EED-Q-242(R3)
2.4	Power Supply Distribution	--	NES 532
2.5	Change Over Switches	TBC based on equipment fit	EED-Q-264 (R2) **For ATS** - EED-50-78
2.6	Main Switchboard	Minimum Two Fwd SWBD Aft SWBD	EED-Q-264 (R2)
2.7	Emergency Switchboard	One	EED-Q-264 (R2)/ *IN* promulgated SOTRs
2.8	Automatic Power Management System (APMS)	--	EED-Q-264 & EED-50-48/ *IN* promulgated SOTRs
2.9	Emergency Supply System	--	NES-532
2.10	Cabling	Based on equipment fit.	NES-532 EED-50-12(R3) EED-50-13(R2).
2.11	Lighting	TBC	EED-50-33 (R1) EED-50-28
2.12	Internal Communication	--	**Analog MB SRE/ Intercom** EED-51-08 **Sound Power Telephone (SPT**) EED-50-08 (R2)
2.13	EMI/EMC	--	NECP 500 and MIL STD 461 G

2.14	Combat Management System	--	--
2.15	Ship Data Network (SDN)	--	SOTRs
2.16	Data Link	--	SOTRs
2.17	Nav Complex	--	SOTRs

* **Common Information Model (CIM)**. In order to enable seamless exchange of information in a common/ standardised format amongst all systems integrated with each other, a Common Information Model (CIM) would be promulgated for adherence by all weapon/ sensor/ CMS OEMs. The CIM would specify information structure for communication within/ across *IN* CMS and amongst all systems (weapons/ sensors) to accomplish data centric approach thereby forming the basis for interface protocols between systems. It would include common data structures viz range, units, precision etc. This shall enable network enabled operations where various entities in the 'system of systems' communicate seamlessly.

3. **Suggested Equipment.**

Ser	**Name**	**Indicative Number**	**Standards**
3.1	Navigation Aids including IBS	As per latest policy on Nav equipment fit	
3.2	Rotary/ Static Convertors and Helo Starting rectifiers	TBC	EED-Q-267 (R4). EE-50-34 Mil 461E NES 537. NES 627.
3.3	Transformer & Trans-Rectifier	TBC	EED-50-16 (4Wire) & Def Stan 01-535 (3 Wire). EE-50-34
3.4	Battery and Battery charging arrangement	--	EE-50-35
3.5	UPS	TBC	EED-50-77
3.6	Motor & Starters	TBC	EED-Q-071 (R4)
3.7	AEL	TBC	EED-50-28 (R1)
3.8	Switch Sockets	TBC	EED-50-81
3.9	Galley Power supply Isolating Switch	--	NO 27/06, EE/03/ 9712/Safety Audit dated 31 May 19
3.10	Cable Gland	TBC	EED-50-80
3.11	Window Wiper	TBC	DEE policy EE/03/ 9711/Policy/Power/ L-116 dated 08 Sep 21
3.12	HV Mats	TBC	IS-15652-2006

			DEE fax EE/03/ 9712 dated 25 Feb 19.
3.13	NLCP	TBC	EED-Q-262 (R1)

4. **Compartments.**

Ser	Name	Indicative Number	Standards
4.1	Electrical Store	03	--
4.2	Electrical Workshop	01	--
4.3	Electrical Office	01	--
4.4	Switchboard	02	--
4.5	SRE	01	--
4.6	Gyro Compartment	TBC based on equipment fit.	--
4.7	Equipment Rooms	Based on equipment fit.	--
4.8	Converter Rooms	Based on equipment fit.	--

SECTION L – DIVING

1. **Suggested Equipment.** The procurement of the diving equipment should be as per NSQRs promulgated by NHQ.

Ser	Name	Indicative Number	Standards
1.1	1.1.1 Self-Contained Underwater Breathing Apparatus (SCUBA) diving set, AGA Divator 324 MKII (**Make - Interspiro AB, Sweden**) complete consisting of: - 1.1.2 Regulator unit with octopus assembly 1.1.3 Positive Pressure Face Mask 1.1.4 Twin Cylinder pack unit 1.1.5 BCD Jacket	4 each	
	1.1.6 Onboard spares for 5 Yrs	01 set	
1.2	Divers U/W communication system complete (compatible with AGA Divator 324 MKII diving face mask)	02 set	
1.3	General Purpose Inflatable craft complete (with spares and accessories) (As per NCD	04	

	4006, Issue 4, pattern no-N1940-000162:2024 specifications)		
1.4	25/30 HP OBM complete with two flexible fuel tank & 5 year spares	04	
1.5	5 CFM Portable HP air diesel driven compressor with 5 year spares. Working pressure upto 300 Bar.	01	
1.6	Underwater Torch complete 1000 lumens, depth rating 100 mtrs (hand held)	02	
1.7	Lamp Search (underwater) Divers complete (head mounted) with rechargeable battery, charger. Spares 2 years	02	
1.8	Divers underwater digital camera with HD video, depth rating 50 mtrs	01	
1.9	Jacket divers dress (Neoprene 0.5 mm and 3mm thickness) – (Small, Medium, Large 02 each)	6	
	Trousers diver dress (Neoprene 0.5 mm and 3mm thickness) – (Small, Medium, Large 02 each)	6	
	Boots divers dress (Neoprene 0.5 mm and 3mm thickness) – (Small, Medium, Large -02 each)	6	
	Gloves for Divers (Neoprene 0.5 mm and 3mm thickness) in three sizes (Small, Medium, Large -02 each)	6	
1.10	Swim fins (Graphite) with back strap	6 Pairs	
1.11	Tube Snorkel Assembly	04	
1.12	Depth gauge Diver 0-200 ft	01	
1.13	Knife swimmers with Sheath	4	
1.14	Life Belt	6	
1.15	Weight belt (Diver) with four/ six pouches	4	
1.16	Buddy Line	02	
1.17	Lead Weights (1 & 2 Kgs)	6 each	
1.18	Float Spherical for marking (Buoyancy of 5 kgs)	04	
1.19	Sinker Concrete 25 kgs	02	
1.20	Divers Lifeline (8 mm) (220 mts roll)	02 rolls	

1.21	Diver Adjustable ladder	01	
1.22	Enclosed BA Charging Station	01	
1.23	Metallic Blast Bay Tank	01	
1.24	Anchor Magnets with carry case (minimum 1 50 Kg holding force)	04	
1.25	Flood lights of minimum 200 watts each along with provision for fitment of these two overhead floodlights at the Quarter Deck to undertake diving operations at night.	02	

2. **Compartments**

Ser	Name	Indicative Numbers	Standards
2.1	Diving Store	01	
2.2	VBSS/ Special Ops Equipment Store	01	
2.3	POL Storage Space (RU locker)	01	
2.4	OBM After Use Tank	01	
2.5	Wooden Chokes for stowage of inflatable crafts	01	
2.6	Portable Diving Compressor stowage space	01	
2.7	Blast Proof Charging Bay	01	
2.8	Fresh Water Point for after use of diving equipment	01	
2.9	Davit/ Crane	02	
2.10	Metal Blanks	As per blanks	
2.11	Fridge	01	

SECTION M - AVIATION

Operating Parameters

1. **External Environment Limitations**. As a general rule, helicopter operations from ***IN*** ships along with full operational capability, are limited to ship motions not exceeding +6° roll and +2° pitch. The presence of the helicopter in the ship shall not, in any way, diminish the ship's basic design capability to survive in extremely high sea states. The ship must provide sufficient protection for the helicopter to survive the same high sea states to the extent that the helicopter operations may be resumed once sea state have subsided.

2. **Internal Environment Limitations - Manned Locations**. Manned spaces within the ship aviation facilities are to be ventilated and air conditioned to maintain an effective temperature of not more than 24º C.

3. **Aircraft/ RPA**. The ship should be fully capable of undertaking stage through operations (by day) for 01 ALH/ UH-M/ CH (Max All up Weight approx. 5.8 Tonnes)

4. Dimensions of ALH is as tabulated below. Details *wrt* UH-M will be provided when available. However, for all practical purposes, dimension of UH-M may be considered akin to ALH.

Particulars	ALH
Max AUW	Approx.5.8 T
Length Overall	Approx.15.87 m
Length blade folded	Approx.15.87 m (two blade fold)
Width (blade folded)	Approx.3.5 m
Height	Approx.5.1 m

5. **General Requirement**. Helo deck is designed as per the 'Max Take off All-up Weight (MTOW)' of the heaviest of the helicopters that the ship is expected to operate. Other specifications like rotor diameter, fuselage dimensions, wheel landing configuration etc of the helicopter decides the dimensions of the Helo deck.

6. **Airwake and Helo Deck Turbulence**. Airwake and Helo Deck turbulence are critical factors for helicopter operations from ship. Computational Fluid Dynamics (CFD) studies and wind tunnel testing to determine the wind environment on deck/ around the ship would be required for **SHOL** of the ship.

7. **Suggested Systems/ Equipment**.

Ser	Name	Indicative Numbers	Standards
7.1	HDCS (indigenized System)	One Set	As per SOTR
7.2	CCTV System	One Set	As per SOTR
7.3	Helo Staring Rectifier (HSR)	One	As per SOTR
7.4	NVG Compatible Helicopter Deck Lighting and Landing aid Suite {Helicopter Visual Landing Aid System (HVLAS)}	One Set	As per SOTR
7.5	TACAN (replacement for MF Beacon) INBR 1760 Chapter 7.2	One	As per SOTR

7.6	Flight Deck Status Indicating and Ordering System. INBR 1760 Chapter 6.9	One set	As per SOTR

8. **Compartments**.

Ser	Name	Indicative Numbers	Standards
8.1	Helo Deck	01	INBR 1760, Section 1
8.2	LSO Compt	01	INBR 1760, Section 6
8.3	Air Store	01	INBR 1760, Chapter 3.3
8.4	POL Store	01	INBR 1760, Chapter 3.7

9. **Specifications**. For a ship which normally carries one helicopter, the 400 Hz starting/ servicing system must be capable of delivering to the Helo Deck receptacles:-

9.1 Continuous rating 50 KVA.
9.2 150% overload rating for two minutes.
9.3 200% overload rating for five seconds.
9.4 Line drop limits in accordance with current standards.
9.5 The line drop limits indicated above are to include the output cable assembly which is plugged into the aircraft servicing receptacles.

10. **Safety/ Interlock System**. The 400 Hz power control and safety/interlock system shall:-

10.1 Include a switch and “external power on” indicator light.
10.2 Interface with aircraft ground monitoring and control in accordance with MIL-PRF- 24021K.

(Ref:- MIL-STD-704F, Aircraft Electric Power Characteristics, for AC and DC normal operating characteristics, and MIL-PRF-24021K – Performance Specifications for Electrical Power Monitors External, Aircraft)

External Voice Communications

11. General Requirements. The external communication system for the Air Department is to be made up of ship's standard communication units dedicated to the Air Department. The technical requirements for the VHF and UHF units required are covered in the external communications specifications for the ship. Only the outfitting requirements are covered in this section.

12. V/UHF Units. The LSO compartment shall be provided with two complete contemporary V/UHF Transmitter/Receivers, one for primary communication and the other for backup.

13. Remote Control. Transmitter/Receiver remote controls comparable to those supplied for the ship's external communication system are to be provided in the LSO compartment. A common input shall be used for V/UHF external communications and all internal communications at the LSO positions.

14. Headset Feature. The LSO shall use a split headset, one side for internal communication and one for external. Individual volume controls for each audio channel shall be provided and incorporated into the consoles. The headset should also employ active noise cancellation technology.

15. Emergency Set. An emergency backup V/ UHF shall be provided in the LSO position. This radio would be independent of all internal communications and with a suitable battery backup. An integral trickle charge battery pack would need to be provided.

Helicopter Fuelling

16. **Functional Requirement**. The aviation fuel system shall be capable of carrying out the following functions:-

16.1 Transporting helicopter fuel from its upper deck reception point to the helicopter fuel storage tanks.

16.2 Storing helicopter fuel on board the ship.

16.3 Cleaning and conditioning helicopter fuel held on board the ship to remove water and solid contamination.

16.4 Fuelling a helicopter in the following modes:-

16.4.1 While on the Helo Deck with engines shut down.

16.4.2 While on the Helo Deck with engines running.

16.5 De- fuelling a helicopter.

16.6 Transferring fuel from the storage tanks to a disembarkation point on the upper deck of the ship.

17. **Performance Requirements**. The aviation fuel system shall confirm to the following requirements:-

17.1 Should be capable of taking fuel at a rate of 85 cubic metres/hr. The system shall have sufficient usable helicopter fuel storage capacity to sustain the selected helicopter for not less than **50 flying hours**. For LCU Mk V the calculate storage capacity is at least **20 T**.

17.2 The system shall be capable of pressure fuelling a helicopter on the Helo Deck at a maximum rate of 680 to 800 litres per minute.

17.3 The system shall be capable of operation in the gravity mode, limited to 100 kPa in no- flow condition.

17.4 The system shall be capable of de-fuelling a helicopter at a rate of 120 ± 20 litres per minute.

17.5 Quality of fuel delivered to the aircraft shall meet the standards as promulgated by NAQAS.

17.6 The fuel filling nozzle to be provided should incorporate a digital flow meter.

Fuelling Compartments

18. **Physical Characteristics**. A compartment shall be provided to contain all the helicopter fuel pumps and conditioning equipment. This compartment shall be fitted with forced extractors which can be switched on/off from outside the compartment.

19. **Helo Deck Fittings**. A storage area on the Helo Deck or in the Hangar shall be provided for the helicopter fuelling hose, grounding wire and connection equipment. This storage area (fuelling cabinet) shall be as compact as possible and close to the helicopter fuelling position to allow rapid access to the fuelling hose and equipment. It shall also be positioned so that it does not interfere with helicopter operation or present a safety hazard should an emergency, such as a helicopter crash or fuel spill, occur. The fuelling cabinet should contain:-

19.1 A hose storage device.
19.2 A grounding cable reel.
19.3 A re-circulation connection, complete with protective cap.
19.4 A communication system.
19.5 Remote controls for the pumps fitted in the pump room.
19.6 Fuel cleanliness monitoring/sample point.
19.7 A flow meter.
19.8 Storage for the helicopter fuelling nozzle.

20. **Fuel Tanks**. Storage tanks with adequate redundancy for the aviation fuelling system shall be fitted on board the ship.

21. **Hose Assemblies**. The fuel piping system shall terminate on the Helo Deck in a Two inch internal diameter hard wall hose assembly of sufficient length to attach to the aircraft fuelling connection when the aircraft is parked anywhere on the Helo Deck. The fuelling hose assembly shall consist of:-

21.1 A Two-inch nominal diameter fuelling hose.
21.2 A contemporary nominal 2.5-inch diameter pressure fuel servicing nozzle with embedded digital flow meter.
21.3 Pressure and Gravity fuelling nozzle.
21.4 A static grounding reel assembly attached with the hose.
21.5 The fuelling hose shall be located in such a position so that the fuelling operations can be carried out with Hangar shutter in closed position or a suitable trap door should be provided on the face of the Hangar door.

22. **Stowage**. When not in use, the hose assembly shall be stowed in the fuelling cabinet. It shall not require disconnection or separation for stowage purposes, and shall be withdrawn from the Helo Deck by a power assisted/ manual means. To facilitate moving the hose assembly both onto and away from the Helo Deck area, suitable guides, rollers, or similar devices shall be provided to control the hose during passage through confined spaces, and around obstructions.

Fuel Conditioning Equipment

23. **Temperature Indicating Device**. A temperature indicating device shall be fitted to each fuel pump to protect against fuel being inadvertently re-circulated through the pumps pressure relief system and the fuel subsequently heating above its flash point. This temperature indicating device shall sound an audible alarm in the ship's Machinery Control Room when the fuel temperature exceeds 40 Deg C.

24. **Flow Measuring Device**. The system shall be equipped with a fuel flow measuring device. This device shall measure in litres and be capable of operating at a flow rate up to 800 litres per minute. A readout from this unit, which is capable of being zeroed, shall also be provided at helo deck in close proximity to the fuelling point and in the LSO compartment. Inline fuel quality analyser as per INBR 3000 to be included in the system.

25. **Safety Feature**. All equipment in the pump room shall be explosion proof in accordance with current regulations.

26. **Communication**. A hands free wireless headset shall be provided to service tank and helo deck for obstruction free and reliable communication.

SECTION N – LOGISTICS

1. **Compartments**.

Ser	Name	Indicative Numbers	Standards
1.1	Ward Room	01	
1.2	Dining Halls	01	
1.3	Naval Store and Stationary Store	02	
1.4	Ship's Office (with SD section) and Store Office	02	
1.5	Transport		
1.6	Galley	01	
1.7	Pantries	03	
1.8	Cool Room/ Cold Room	01 each	
1.9	Victualling Store	05	
1.10	Provision Lift	01	
1.11	Servery	02	

2. **Suggested Equipment**.

Ser	Description of galley equipment	Indicative Numbers	Standards
2.1	Garbage Disposal Unit as per IMO/ MARPOL	1	
2.2	Industrial Toaster	2	
2.3	Refrigerator Industrial	1	

2.4	Dough Kneading Machine commercial	1	
2.5	Wet Grinder	1	
2.6	Combi – Steamer/ Merychief	1	
2.7	Conduction based cooking ranges	3	
2.8	Spice Pulveriser (Portable)	1	
2.9	Food Processer (Portable)	2	
2.10	Potato Peeler (Portable)	1	
2.11	Rice Boiler Electric (Tilting Type)	1	
2.12	Fixed Rodent Repellent system	2	
2.13	Floor Cleaning Machine dry and wet (Portable)	1	
2.14	Veg Cutting Machine with 02 blade sets (Portable)	1	
2.15	Deep Freezer	2	
2.16	Water Boiler	1	
2.17	Ventilation System Complete (Including Electric Chimney)	1	
2.18	Storage Rack (Handi Storage)		
2.19	Storage Rack Crockery		
2.20	Work Counter	2	
2.21	Sandwich Maker (Portable)	2	
2.22	Water Purifier	1	
2.23	Water Dispensing Machine	2	
2.24	Bain Marie (Portable)	1	
2.25	Tea/ Coffee Making Machine (Portable)	1	
2.26	Chapati Making Machine	1	
2.27	Gimbaled Frame Deep Fat Fryer	1	
2.28	Tilting Frying Pan	2	
2.29	Masala Trolley (Portable)	2	
2.30	Juicer	1	
2.31	Ice Making machine	1	

SECTION P - HABITABILITY

1. **Standards**

1.1 Naval Standards.
1.2 Classification Society rules.

2. **Suggested Equipment**

Ser	Name	Indicative Numbers	Standards
2.1	Amenities and Furnishings for all living spaces	As per complement and NHQ guideline specifications	• DefStan 02-107 • DefStan 02-120 • NHQ Guideline Specifications for standardisation of accommodation and hull compartments of Naval Ships. • NHQ Guideline Specifications for habitability upgradation and modular accommodation works onboard Indian Naval Ships. Class rules

3. **Compartments**

Ser	Name	Indicative Numbers	Standards
3.1	Captain's cabin	01	• Def Stan 02-107 • NHQ Guideline Specifications for standardisation of accommodation and hull compartments of Naval Ships • NHQ Guideline Specifications for habitability upgradation and modular accommodation works onboard Indian Naval Ships Class rules
3.2	Executive Officers' Cabin	01	
3.3	Officers' cabins	04	
3.4	Sailors' Messes	To accommodate 75 sailors as per hierarchy *iaw* NHQ guideline specifications	
3.5	Troop Officers' Cabins	To accommodate > 190 troops and 05 > officers *iaw* NHQ guideline specifications	
3.6	Troop Messes		
3.7	Civilian's Accommodation	01 (To accommodate 03 civilians)	
3.8	Toilets	As per complement and NHQ guideline specifications	• DefStan 02-107 • DefStan 02-120 • DefStan 02-718

			• NHQ Guideline Specifications for standardisation of accommodation and hull compartments of Naval Ships. • NHQ Guideline Specifications for habitability upgradation and modular accommodation works onboard Indian Naval Ships. Class rules
3.9	Recreation Spaces	As per design	

SECTION Q – MEDICAL

1. **Standards**. NES106

2. **Suggested Systems**. Nil

3. **Suggested Equipment**. The ship will be provided with equipment scale **N-1 Type C by AFMSD** as per GOI MoD letter 20069/ME Scale/DGAFMS/DG2C/*IN* SHIPS/MoD/572/07/D (Med) dated 23 Jul 07 or current policy in vogue at the time of commissioning.

Ser	Name	Indicative Numbers	Standards
3.1	Stretchers	10	
3.2	First Aid Boxes (FAB)	09 (min)	
3.3	Cardiac defibrillator	01	
3.4	Multichannel ECG Machine 12 Lead	01	
3.5	Multi Parameter Monitor	02	
3.6	AED	02	
3.7	Oxygen concentrator	01	
3.8	Ophthalmoscope (Portable)	01	
3.9	Auroscope (Portable)	01	
3.10	Transport/ Portable Ventilator	01	
3.11	Portable suction apparatus	01	
3.12	Doctors bag complete with all equipment	02	
3.13	Autoclave Unit	01	
3.14	Sick bay Beds	02	
3.15	Apparatus Oxygen Portable light weight set – 200ltr with bullnose fitting and pressure guage	02	

4. **Compartments**. The following to be ensured for Medical Compt as far as possible: -

4.1 All medical compartments and OTs are to be in close proximity of each other, as far as practicable.

4.2 Direct access through doors, opening into the main alleyway to be provided to Medical space, for ease of casualty movement.

4.3 All alleyways and hatches to be so designed so as to enable easy carriage of casualty stretchers.

Ser	Name	Indicative Numbers	Standards
1	Sickbay	01	NES 106
2	Dressing Room	01	NES 106
3	Dispensary	01	NES 106
4	Medical Store	01	NES 106
5	First Aid Posts	At least 2	NES 106
6	Emergency OT	01	

SECTION R – INFORMATION TECHNOLOGY

1. **Standards**. Naval

2. **Suggested Systems.**

Ser	Name	Indicative Numbers	Standards
2.1	ALAN		The overall network architecture should conform to IEEE 802 set of standards of LANs. The standard recommended to be implemented is 802.3ae-2010 standard with full duplex switches only. Networking and subsequent connection to NUD are governed by DIT Policy IT/0622/01/Policy dated 10 Aug 15

3. **Suggested Equipment**.

3.1 List of deliverables :-

Ser	Recommended Items	Indicative Quantity
Hardware		
3.1.1	Blade Servers	02 with Chassis
3.1.2	Desktop Personal Computers	20 + 20%
3.1.3	1 KVA UPS	Qty same as No. of PCs
3.1.4	Core Switches (L3)	04
3.1.5	Zonal (access) Switches (L2)	02
3.1.6	SAN Storage	6 TB SAN and 4 TB NAS usable capacity in RAID 5 configuration.
3.1.7	Network Laser Printers	02
3.1.8	Scanner	03
3.1.9	Standalone Laser Printer	04
3.1.10	Multi Function Printer	01
3.1.11	Desk Jet Printer	04
3.1.12	UPS 40 KVA (N+1)	01
3.1.13	Server Rack- 42 U	01
Software		
3.1.14	Windows Server 2016 Standard edition or latest available	01
3.1.15	Windows Exchange Server 2016 or latest available with 80 CALs for clients	01
3.1.16	Microsoft Office 2016 Professional edition or latest version	20

Networking Components		
3.1.17	Fibre Optic Cable, outdoor Armoured cable	As per actuals
3.1.18	Cat 6 cable	As per actuals
3.1.19	RJ 45 Connectors	As per actuals
3.1.20	I/O Boxes IP 67 Compliant	03
3.1.21	I/O boxes	As per actuals
3.1.22	24 Port rack mounted LIUs with SC coupler	01
3.1.23	24 Port rack mounted UTP CAT 6 jack panel for STP cable	02
3.1.24	Patch Cords of various sizes	As per actuals
3.1.25	Plastic Conduit	As per actuals
Tool Kit and Spares		
3.1.26	L2 Switches	02
3.1.27	Cat 6A Cable	As per actual
3.1.28	Patch Cords- 3', 7', 9' and 15'	10 pieces each
3.1.29	Cable Preparation Tools(Crimp tool and Stripping Tool)	02 Sets
3.1.30	RJ Plug Termination Tool	02 Sets
3.1.31	Fibre Optic Test Equipment and LAN Tester	02 Set
3.1.32	Micro Test LAN Scanners	01 Set
3.1.33	RJ 45 Connector	500 Nos.

4. **Compartments**. Nil

SECTION S – MET

1. **Suggested Equipment/ Instruments**.

Ser	Name	Indicative Numbers	Standards
1.1	Aneroid/ Digital Barometer	02	BIS No. IS 5793:1970
1.2	Max, Min, Dry & Wet Bulb Thermometer with casing	04	-
1.3	Whirling Psychrometer	02	BIS No. IS 5946: 1992
1.4	Hand Held Anemometer with wind vane	02	BIS No. IS 5799:1970
1.5	Mobile Met Kit	01	-
1.6	MAWOS	01	NA

2. **Compartments**. Nil

Appendix B
(Refer to Para 7(a) of RFI)

VENDOR INFORMATION PROFORMA

1. **Name of the Vendor/ Company/ Firm and Unique ID (if any).**

_____

(Company profile including Share Holding pattern, in brief, to be attached). In the eventuality of the firm emerging as L1, Contract will be concluded in the name and address of the firm, as indicated here). Vendors are to undertake that any subsequent proposal for change in name of firm or address, will be intimated to NHQ MoD at the first available opportunity and supporting documents be furnished accordingly within five working days of their approval by the competent authority.

2**.** **Type (Tick the relevant category)**.

Original Equipment Manufacturer (OEM) Yes/ No
Authorised Vendor of foreign Firm Yes/ No (attach details, if yes)
Others (give specific details) _____

3. **Contact Details**.

Postal Address: _____

City**:** _____ State**:** _____
Pin Code**:** _____ Tele **:** _____
Fax: _____ URL/Web Site**:** _____
Email: _____

4. **Local Branch/ Liaison Office in Delhi (if any)**.

Name & Address: _____
Pin code: _____Tel : _____Fax: _____ E mail : _____

5. **Financial Details**. Category of Industry (Large/ medium/ small Scale):_____

6. **Certification by Quality Assurance Organisation**.

Name of Agency	**Certification**	**Applicable from (Date &Year)**	**Valid till (Date &Year)**

7. **Details of Registration**.

Agency	**Registration No**.	**Validity(Date)**	**Equipment**
DGS&D			
DGQA/DGAQA/ DGNAI			
OFB			
DRDO			

Any other Government Agency			

8. **Membership of FICCI/ ASSOCHAM/ CII or other Industrial Associations**.

Name of Organization: _____

Membership Number: _____

9. **Equipment/ Product Profile (to be submitted for each product separately)**

(a) Name of Product : _____
(IDDM Capability be indicated against the product)
(Should be given category wise for e.g. all products under night vision devices to be mentioned together)

(b) Description (attach technical literature): _____

(c) Whether OEM or Integrator : _____

(d) Name and address of Foreign collaborator (if any): _____

(e) Industrial License Number : _____

(f) Indigenous component of the product (in percentage)**:** _____

(g) Status (in service / design & development stage): _____

(h) Production capacity per annum:_____

(j) Countries / agencies where equipment supplied earlier (give details of quantity supplied) : _____

(k) Estimated price of the equipment _____

10. Alternatives for meeting the objectives of the equipment set forth in the document.

11. Any other relevant information: _____.

12. **Declaration**

(a) It is certified that the above information is true and any changes will be intimated at the earliest**.**

(b) It is certified that in the past that _____ (name of firm) has never been banned/debarred for doing business dealings with MoD/ GoI/ any other Government Organization and that there is no inquiry going on by CBI/ED/any other Government agency against the firm.

Authorised Signatory)

Appendix C

(Refer to Para 7(a) of RFI)

ADDITIONAL INFORMATION PROFORMA (INDIAN SHIPYARDS)

1.	Year Established							
2.	Type of Organisation size/Classification of Yard							
3.	Organisation setup and availability of skilled Manpower							
4.	Details of design, planning and production facilities/infrastructure including slipways/ dry docks and wet basin/water front (attach brochures etc.)							
5.	Annual build capacity (in tonnage)							
6.	Details of future expansion and business development planned							
7.	Vessels delivered in last 05 years. (attach previous order copies for 06 X LCU MK V / Similar Vessel only)							
	Yard	Customer	Type of vessel	Dwt,grt	Order date	Start production	Contractual delivery	Actual delivery
8.	Orders in hand (attach order copies for similar ships/ Vessels only)							
	Yard	Customer	Type of vessel	Dwt, grt	Order date	Start production	% completed	Expected delivery
9	Financial information (in INR for Indian vendors and in US dollars for foreign vendors)							
	(a)	Annual turnover in the last three financial years (year wise)						
	(b)	Profits made						
	(c)	Net Worth = equity+ reserves						
	(d)	Debt/Equity ratio						
	(e)	Quick Ratio = (current assets long term debts)/current liabilities						
	(f)	Attach copies of certified published annual report showing turnover and financial status in support of above information						
10	Detailed specifications of 06 X LCU MK V offered to meet the specified requirements and build period from date of order							
11	Detailed specifications of commercially off the shelf (COTS) 06 X LCU MK V, if available for outright purchase, if any							

(Authorised Signatory)
Appendix D
(Refers Para 12 of RFI)

GUIDELINES FOR FRAMING CRITERIA FOR VENDOR SELECTION/ PREQUALIFICATION IN RESPECT OF 06 X LCU MK V UNDER BUY (INDIAN-IDDM) CATEGORY

1. The guidelines prescribed for short-listing/ pre-qualification of Indian vendors in this instant case of 06 X LCU MK V under Buy (Indian-IDDM) category is enumerated in the succeeding paragraphs. **Paragraph 2** deals with the parameters that may be considered for short-listing of vendors, whereas **Paragraph 3** amplifies the process for applying selected parameters to the process of Vendor Short listing.

2. **Parameters**

(a) **General Parameters**.

(i) Applicant Entity should be an Indian Vendor as defined at Paragraph 20 of Chapter I of DAP 2020.

(ii) Business dealing with applicant Entity or any of its allied entities should not have been suspended or banned, by MoD/ SHQ or any Government Department or organization (as defined in Guidelines for Penalties in Business Dealings with Entities issued vide Ministry of Defence, D(Vigilance) MoD ID No 31013/I/2006-D (Vig) Vol II dated 21 Nov 2016). None of the Promoters and Directors of applicant entity should be a willful defaulter.

(iii) "Entities" will include companies, with whom the Ministry of Defence has entered into, or intends to enter into, or could enter into contracts or agreements.

(iv) "Applicant entity" may be a company, subsidiary, an associate company (as defined in the Companies Act, 2013), a consortium or a Joint Venture (JV).

(b) **Technical Parameters**.

(i) Vendor shall be a manufacturing entity or a system integrator of defense equipment and not a trading company, except in cases where the OEM participates only through its authorized Vendors.

(ii) Minimum **two years**' experience in **broad areas like manufacturing/ electronics/ explosives etc. as applicable in the instant procurement case**. If not, then cumulative experience of at least three years in above areas, resulting in gaining of competence for manufacturing the proposed product. (In case the SHQ feels that for a particular equipment a lesser experience could be accepted, then the same

should be got approved by the competent authority before including the same in the RFP).

(iii) Where product involves integration, previous experience of not less than one year/ one project in integration of systems/ equipment shall be required.

(c) **Financial Parameters**. For RFI of Shipbuilding cases (acquisition of Ships, Yardcraft & Submarines), financial parameters stipulated at Annexure II to Appendix C, Chapter XII, DAP-20 shall be followed.

(d) **Other Parameters**.

(i) **Industrial License (IL)**. Vendors should be either holding a valid defense industrial license or should have applied for the same before responding to RFP. In any case the vendor must confirm holding of IL before commencement of FET. (Items requiring IL will be as per DIPP Press Note 3 of 2014 as amended from time to time).

(ii) **Registration**. Registered for a minimum of two years (one year for SMEs). Minimum number of years not applicable for JVs constituted specifically for a project.

3. **Stipulations for Applying Parameters**.

(a) **Areas like manufacturing/ electronics/ explosives etc**. referred at Paragraph 2(b)(ii) should be defined in each case of procurement.

(b) In case the Applicant Entity is unable to meet the Financial Parameters by itself, it may rely on its **Holding Company** (as defined in the Companies Act, 2013 and amendments thereof) ("Companies Act") for fulfilment of the Financial Parameters, in which case reliance must be placed on the Holding Company towards fulfilment of **ALL** the Financial Parameters.

(c) In case the Applicant Entity is unable to meet one or more of the Technical Parameters by itself, it may rely on a Group Company(ies) for fulfilment of the Technical Parameters. A Group Company in relation to the Applicant Entity may be:-

(i) A company of which the Applicant Entity it is an Associate Company. Such company should have ownership, directly or indirectly, of at least 26% of the voting shares of the Applicant Entity.

(ii) A company which is an Associate Company of the Applicant Entity. The Applicant Entity should have ownership directly or indirectly, of at least **26%** of the voting shares of such Associate Company.

(iii) A Company with whom the Applicant Entity is commonly owned, directly or indirectly, for at least **26%** of the voting shares by another company. For example: An Applicant Company A is an Associate Company of Company B, in which B holds at least 26%. Further, C is also an

Associate Company of B, in which B holds at least 26%. In this case the Applicant Company may use the credentials of C as well.

(iv) The Holding Company and Subsidiary Companies (as defined under the Companies Act) of the Applicant Entity.

(d) The Applicant entity may be a single entity or a group of entities (the "Consortium"), coming together to implement the project. In such case: -

(i) The credentials of only those members or their related entities may be counted, who have at least **26%** equity stake in the Consortium.

(ii) Each Consortium should have a designated Lead Member.

(iii) For Technical Parameters, **any of the Consortium members or their Group Companies** may meet the criteria.

(iv) For Financial Parameters; the Turnover and Net Worth of the Consortium Member shall be reckoned **proportionate to Consortium Member's equity stake** in the Consortium, and each Consortium member should meet the other criteria pertaining to Insolvency and Credit Rating. In case the Consortium Member relies on its Holding Company for any one of the above-mentioned Financial Parameters, then reliance must be placed on the Holding Company for meeting **all the financial Parameters**.

(e) Vendors should provide all necessary self-authenticated documentation in support of their achievement of criteria. Such documentation should inter-alia include: -

(i) Details of projects/ supply orders successfully executed in the last two years.

(ii) Annual reports for three years of applicant entity, parent and associate companies, consortium and JV partners.

(iii) Details of shareholders, promoters, associated, allied and JV companies.

(iv) Details of vigilance action, viz. ongoing investigation and suspension/ debarment/ blacklisting actions against the applicant entity or any of its allied entities, parent company or consortium and JV partners, if any by any Department/agency of Central Government.

(v) A certificate from CA/CS indicating the financial parameters for the last three years as per Paragraph 2(c).

(**Note**: If a vendor is already a supplier to MoD and/ or has already provided the above documents in such cases, it should be necessary for the vendor to resubmit only such documentations as is necessary to update the above).

(f) Any vendor furnishing false information will be liable for action as per existing guidelines.

(g) Based on these generic parameters, more specific criteria should be evolved by the SHQ with regard to Technical and Financial parameters {Paras 2(b) and 2(c) above} in each procurement case depending upon requirements peculiar to each case keeping in view the overall need to ensure wider vendor participation. The specific criteria evolved by the SHQ for each case, as per these guidelines, may be got approved by the competent authority before including the same in the RFPs.

4. The criteria for vendor selection shall be clearly stipulated in RFPs so as to maintain transparency. Care shall be taken to ensure that the stipulated criteria are not open to subjectivity and arbitrary interpretation.