

**COMMERCIAL IN CONFIDENCE**

**REQUEST FOR INFORMATION**

**PROCUREMENT OF NAVAL UTILITY HELICOPTER (NUH),  
SIMULATORS AND ASSOCIATED EQUIPMENT AS  
FOR INDIAN NAVY (IN) THROUGH STRATEGIC PARTNERSHIP**

1. **Introduction**. The Ministry of Defence (MoD), Government of India, intends to procure approximately 111 Naval Utility Helicopters (NUH) along-with two flight simulators, one maintenance simulator and infrastructure including Transfer of Technology (ToT), associated shore support, Performance Based Logistics (PBL), training, documentation and spares package along with contemporary state of the art equipment, weapons and sensors under Strategic Partnership i.a.w. Chapter VII of DPP 2016. The Indigenous Manufacture (**IM**) portion of the procurement is to be manufactured in India based on design to be provided by the foreign Original Equipment Manufacturer (OEM) to the nominated Strategic Partner.
2. The MoD, Government of India seeks information from the helicopter OEM(s)/ authorized agencies for participation in NUH project in accordance with Chapter VII of DPP 2016.
3. **RFI Structure**. This Request for Information (RFI) consists of two parts as indicated below: -
  - (a) **Part I**. The first part of RFI incorporates the intended use of helicopter and features that should be met by the OEM(s). Essential technical parameters of the helicopters and ToT sought are also mentioned.
  - (b) **Part II**. The second part of the RFI states the methodology of seeking response of OEMs. Submission of incomplete response format will render the OEMs liable for rejection.

**Part-I**

4. **The Intended Use of Helicopter**. The helicopter should be able to perform the following roles by day and night:-
  - (a) Search and Rescue.
  - (b) Medical Evacuation (MEDEVAC).
  - (c) Communication Duties.
  - (d) Anti-Piracy and Anti-terrorism.
  - (e) Humanitarian Assistance and Disaster Relief (HADR).
  - (f) Surveillance and Targeting.

**COMMERCIAL IN CONFIDENCE**

5. **Essential Technical Parameters**. The helicopter should be twin-engine, piloted by two pilots, having wheeled landing gear and blade fold capability. The helicopter should be capable of operating from ships and ashore. Towards maritime surveillance and targeting capability, weapons to meet the envisaged role would be required to be integrated with the helicopters. OEM(s) are requested to provide quantified technical, operational and maintenance parameters as queried in **Appendix A**, as per existing/ achievable capabilities (with time frame). In addition, the OEM is to provide **Para-wise** compliance for all aspects brought out at **Appendix A**, along with specific comments for compliance (if any). Supporting relevant documents and literature are to be provided. Vendors may also utilise this opportunity to recommend the capabilities proposed in terms of Essential Parameters-A and Essential Parameters-B i.a.w DPP 16. OEMs may provide additional info, if any, considered suitable towards performance of helicopter.

6. **Field Evaluation Trials**. The Field Evaluation Trials will be conducted in accordance with Chap VII of DPP 16. OEMs may indicate suggested trial methodology and parameters for which evaluation can be done through simulation/ certification/ documentation/ demonstration etc at TEC/ FET stage.

7. **Approximate Cost Estimate**. The OEM is to provide indicative cost for NUH program under SP Model outlined in Chapter VII of DPP 2016. The OEM(s) should take into account all aspects of supply of production material, construction, ToT, trials, documentation, training and life cycle support for a period of 30 years. Other aspects (if any) may be mentioned specifically. Breakdown of cost (separate for Indian and Foreign components) is to be indicated.

8. **Basic Design**. The Foreign OEM is to indicate the Basic Design (Base Model) of a proven helicopter based on which the current design is being proposed along with the names of customer navies or Coastguard to whom the same or similar helicopter (model of helicopter) has been contracted or delivered. In addition, the range of Air launched Light Weight Torpedoes and Depth Charges that are available in the world market and have already been integrated or capable of being integrated into the basic design of helicopter on offer is to be indicated.

9. **Acceptance of Foreign OEMs Govt**. The foreign OEM is to state in unambiguous terms that, *“as a part of the Expression of Interest (EoI), OEMs will provide a formal acceptance of their Govt that necessary license to transfer technology will be granted in case the OEM is selected as a partner for the Indian SP to manufacture the platforms or equipment in India, wherever required, prior to issuance of RFP”*. Requirement to conclude inter governmental agreements between India and the countries concerned, at the stage of award of contract may also be intimated.

10. **Transfer of Technology (ToT)**. The Government of India, Ministry of Defence is desirous of acquiring technologies including detailed manufacturing know how of the helicopter being offered by the OEM. The key requirements related to ToT which are to be fulfilled by the OEMs are given at **Appendix B**. In case any ToT

**COMMERCIAL IN CONFIDENCE**

requirement cannot be met, the level of minimum acceptable ToT as per **Appendix G** to Schedule 1 to Chapter II of DPP 2016 along with the percentage of achievable value addition is to be indicated. Government of India reserves the right to negotiate ToT terms subsequently but the availability of ToT would be an essential pre requisite for processing the instant case. The OEMs are to give Para wise compliance to the ToT requirements at **Appendix B**. The guidelines for ToT are placed at **Appendix C**. The ToT plan is to be submitted highlighting the following:-

- (a) Range, depth and scope of technology transfer offered in identified areas.
- (b) Extent of indigenous content proposed.
- (c) Extent of eco-system of Indian vendors/manufacturers proposed.
- (d) Measures to support Strategic Partner (SP) in establishing system for integration of platforms.
- (e) Plans to train skilled manpower in India.
- (f) Extent of future Research and Development (R & D) planned in India.

11. **Indigenisation Content (IC)**. In line with the 'Make in India' initiative of the Government of India, the OEM is to ensure that all efforts are made to maximize the Indigenous Content (IC) of the project without any deterioration in performance standards as specified at **Appendix A**. India has developed a vibrant industrial ecosystem of helicopter equipment which is engaged in design and manufacture of cutting edge components and equipment for use on other Indian Projects. OEMs are to maximize **Indigenous Content (IC)** in the proposed design. The IC will be stipulated in the EoI and shall not be less than 40% on cost basis of the Make portion of contract as calculated in accordance with Para 13 of Chapter 1 of DPP-16.

12. **Integration of Weapons and Sensors**. The OEM is to indicate experience in integration of customer designated or nominated weapons and sensors while designing the integrated platforms. The weapons and sensors integration experience shall include airborne Light Weight Torpedo (LWT), Depth Charge and sensors {such as Electro Optical (EO) Pod, Data Link, Self Protection Suite, Software Defined Radio, Identification of Foe and Friend (IFF) responder etc}. The details of weapons and nominated equipment shall be intimated at a later date. Any reservation regarding integration of weapons and sensors from suppliers of other countries is to be highlighted in unambiguous terms. However, Ministry of Defence, GoI shall facilitate necessary clearances for release of the required interface codes of weapons from weapon suppliers to the OEM or his sub-vendors (as per requirement).

13. **Tentative Delivery Schedule**. The OEM is required to indicate the overall time frame of delivery of 'Fully Furnished Buy' component of helicopter and helicopters 'made' in India. It should include stage wise break-up of the entire project

## **COMMERCIAL IN CONFIDENCE**

4

post conclusion of contract. The delivery schedule is to be in line with the training schedule and schedule of Technology Transfer. In drawing up the delivery schedule the following guidelines are to be borne in mind:-

(a) Few helicopters are to be initially delivered in Basic version (**as indicated in Appendix A**) to meet immediate requirement of **training** and **SAR**.

(b) All helicopters in Basic Version are to be upgraded to Fully Configured Version and undertaken obsolescence management prior completion of delivery of the last helicopter.

(c) Helicopters and simulators are to be delivered in batches along with proportional spares, Ground Support Equipment (GSE), Ground Handling Equipment (GHE), spare engines and documentation.

(d) Weapons are to be delivered in a phased manner proportionally along with the Fully Configured Version.

(e) Facilities for 'O' and 'I' level maintenance facility is to be set up in stages at least one months prior to delivery of helicopter at designated place. MRO facility is to be set up in India for 'D' level maintenance and overhaul of helicopters. OEM is to indicate proposed timeline for setting up of MRO.

14. **Warranty**. The supplied helicopter (s) and equipment shall carry a warranty of 24 months from the respective date of delivery or acceptance of each helicopter and equipment, whichever is later. The warranty should cover both hardware and software as applicable. The simulators shall carry Comprehensive Annual Maintenance Contract of 10 years after warranty.

15. **Service Life of Helicopters**. The minimum Service Life of the Helicopter is required to be 30 years. The OEM is required to give details of the reliability model, reliability prediction and its validation by designer or manufacturer to ensure reliability of stores throughout the service life of the Helicopters. In addition availability of stores/ spares is to be ensured as stipulated in 'Product Support Requirements'.

16. **Manpower Requirements**. The OEM is to indicate the Broad requirements of crew to man the Helicopter, for Indian Helicopter Training Team, Shore Support Organisation, Logistics Establishment, Operational Maintenance staff, etc. Need to keep manpower requirement to minimum commensurate with operational and functional efficiency is to be borne in mind.

17. **Training of Crew and Maintenance Personnel**. The OEM is to provide Broad plan of training of all personnel as applicable (Helicopter crew, Shore support staff, Certification staff, Maintenance staff, etc). As far as possible the training is to be planned in India and requirements of training abroad are to be minimized.

**COMMERCIAL IN CONFIDENCE**

**COMMERCIAL IN CONFIDENCE**

5

18. **Broad Methodology to be Adopted.** Post receipt of the response of the RFI, the methodology adopted to progress the case for NUH will be in accordance with Chapter VII of DPP 2016.

19. The OEM is to furnish details as per the Information Proforma at **Appendix D**. In addition, the OEM is to indicate capability and willingness to execute the NUH programme and provide support to the SP including the following :-

(a) Technical support for manufacturing of helicopter by the SP. This shall include but not limited to consultancy for setting up and modification of infrastructure with SP, training of personnel from SP in requisite skills related to design, manufacture, quality assurance, quality control, preservation of equipment & storing techniques, basic operation of maintenance of helicopter equipment, provision of suitable documentation, providing overseeing support by OEM specialists, etc.

(b) Maintenance and life cycle support to the helicopter during its service life, including Performance Based Logistics and warranty through SP.

(c) Up-gradation of helicopters as part of capability augmentation and to overcome obsolescence during its lifecycle.

(d) Willingness of accepting responsibility in conjunction with the selected SP for the timely production and performance of the helicopters. The same could be implemented by one to one contracts with the Strategic Partner or tripartite contracts involving MoD, selected Strategic Partner and OEM as per Chapter VII of DPP 16.

(e) Willingness to provide product support for Life cycle of the platform, which includes spares and maintenance tools/jigs/fixtures for field and component level repairs through Indian SP.

(f) Willingness to accept all conditions of DPP-16, if not, which Para or Clause of DPP-16 is not acceptable is to be indicated. Further, the OEM may be required to accept the general conditions of contract given in the Standard Contract Document at Chapter VII of DPP placed at [www.mod.nic.in](http://www.mod.nic.in).

(g) Earliest date by which the OEM is willing to give a presentation at IHQ MoD (N)/DAA, New Delhi. The presentation is to be provided by a team of specialists with the required knowledge and mandate for addressing various queries/clarifications made by the Indian Navy.

20. The offers shall be evaluated in accordance with provisions of Chapter VII of DPP-16. The OEM is liable to be disqualified for any materially false statement.

**COMMERCIAL IN CONFIDENCE**

**Part-II**

21. **Procedure for Response.**

(a) **Format.** The details of technical requirements and ToT are to be forwarded as mentioned in **Appendix A** and **Appendix B** of RFI in terms of specifications, parametric information, description and particulars as mentioned against each item. The guidelines for Transfer of Technology are placed at **Appendix C**. In addition, vendors are to provide specific inputs sought for requirements as indicated against each in the Annexure. OEM must also fill the form of response as given in **Appendix D** of RFI. Apart from filling details about company, details about the exact product, available infrastructure, past track record etc should be carefully filled. Additional information on the product and product support facilities can be also attached with the form.

(b) **Address for Response.** The filled form and the response (hard and soft copies) should be dispatched to the under mentioned address:-

The Principal Director  
Directorate of Aircraft Acquisition  
Room No 96, IHQ MoD (Navy), 'A' Block Hutments,  
Dara Shukoh Road, New Delhi 110011

**Fax:** 011-23010528

**Contact Details:** JDAA 011- 23010514

(c) **Time for Response.** Last date of receipt of response is **06 Oct 17.**

22. The Government of India invites responses to this RFI only from Original Equipment Manufacturers (OEM) or Authorised Vendors or Government Sponsored Export Agencies (applicable in case of countries where domestic laws do not permit direct export by OEM). The end user of the equipment is the Indian Navy. The likely timeline for issue of RFP is second quarter of 2018.

23. Reply to this RFI (and further communication on the case, including equipment description, training and documentation) are to be made in English Language only. Response to the RFI is to be provided in hard and soft copy. The compliance tables to all aspects are required to be provided in editable form (preferably Microsoft excel).

24. This RFI is being issued with no financial commitment and the Ministry of Defence 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.

25. The response needs to be detailed with provision of specific or not less than or not exceeding parameters so as to facilitate formulation of Staff Qualitative Requirements at IHQ MoD(N)/DAA.

**Appendix A**  
(Refers to Para 5 of RFI)

**BROAD IMPORTANT TECHNICAL, OPERATIONAL  
AND GENERAL PARAMETERS FOR WHICH INFORMATION IS REQUIRED  
NAVAL UTILITY HELICOPTER**

1. The parameters/ specifications mentioned in succeeding paragraphs are requested in the response to our Request for Information.

**Definitions - Configuration and Versions of Helicopter**

2. **Green Configuration.** NUH in Green configuration would mean a helicopter with following equipment:-

- (a) Radar
- (b) Instrument Landing System (ILS), VHF Omni Directional Radio Range (VOR), Distance Measuring Instrument (DME), Radio Magnetic Indicator (RMI) and Radio/ Radar Altimeter (RADALT).
- (c) Identification Friend or Foe (IFF) transponder, Automatic Identification System (AIS) receiver, Communication Sets (two VHF & UHF combined sets and one HF).
- (d) Cockpit Voice and Flight Data Recorder, deployable Emergency Locator Transmitter (ELT).
- (e) Direction Finder, Rescue Hoist, Emergency Floatation Gear.
- (f) Cockpit with Night Vision Goggle (NVG) compatible lighting.
- (g) Standard equipment for flying in IFR conditions Class 'D' with a crew of two pilots and one Aircrewmen Diver.

3. **Version.**

(a) **Basic Version.** The helicopter in the Basic Version should be capable of undertaking the following missions during day and night (one mission at a time, by configuration of respective role equipment):-

- (i) Search and Rescue.
- (ii) Casualty Evacuation.



**COMMERCIAL IN CONFIDENCE**

- (iii) Communication Duties (Passenger/Cargo Role).
- (iv) Anti-Piracy and Anti-terrorism missions.

(b) **Fully Configured Version.** The helicopter in the Fully Configured Version should be capable of undertaking the following missions during day and night (one mission at a time, by configuration of respective role equipment):-

- (i) Search and Rescue.
- (ii) Casualty Evacuation.
- (iii) Communication Duties (Passenger/Cargo Role).
- (iv) Anti-Piracy and Anti-terrorism missions {including capability to deploy Radar Warning Receiver (RWR), Missile Approach Warning System (MAWS), Countermeasure Dispensing System (CMDs)}.
- (v) Sub Surface Targeting.

**4. Conditions of Use**

(a) <b>Indian Reference Atmosphere.</b> Will the Performance requirements of helicopter be met in Indian Reference Atmosphere (IRA) conditions? The relevant parameters of IRA are as under:-	
(i) Sea level Mean Temperature (°C)	: International Standard Atmosphere (ISA) +20
(ii) Reference Temperature for Takeoff and landing(°C)	: ISA+20
(iii) Reference Temp for performance less (ii) above(°C)	: ISA+15
(iv) Lapse Rate	: 6.5 °C/Km
(v) Mean Sea Level Pressure	: 1005 Hpa
(b) <b>Environmental Conditions.</b> Will the Environmental conditions of operating and storage of helicopter be as per DO 160 or ED14 indice G or MIL STD 810F or Def Stan 00970 or Def Stan 05-123 or equivalent Standard?	

**Operational and General Parameters**

<b>Sr</b>	<b><u>Technical Parameters</u></b>
5.	<b>Capability.</b> Which is the helicopter on offer for NUH? Will it be twin-engine, having wheeled landing gear, blade fold capability and qualified for military

**COMMERCIAL IN CONFIDENCE**

<b>Sr</b>	<b><u>Technical Parameters</u></b>
	operations? Will it be capable of operating from ships and shore by day as well as by night and in Instrument Flight Rules (IFR) conditions? Will it be able to carry out all the roles mentioned at subsequent paragraphs with Maximum All Up Weight up to 5T?
6.	<b><u>Fly Away/CKD/SKD.</u></b> What is the percentage of helicopter proposed to be Fly Away (Max 15%)/Completely Knocked Down/ Semi Knocked Down?
7.	<b><u>Fatigue / Service Life.</u></b>  (a) Will the fatigue life of the helicopter airframe be less than its service life? What would be the service life of helicopter in terms of time (years) and flying hours?  (b) <b><u>Utilization.</u></b> What would be the Utilisation rate of helicopter in following conditions ( <b>fill in below</b> )?  (i) <b><u>Normal Operations.</u></b> ____ hours per month.  (ii) <b><u>Intensive Operations.</u></b> _____ hours per day and _____ hrs per month for a period of at least two months in a year.
8.	<b><u>Role-wise Configuration.</u></b> Will the helicopter fulfill minimum requirements for undertaking the following missions (one mission at a time) with pilots as indicated below?  (a) <b><u>Search and Rescue (SAR).</u></b> Will the helicopter have capability to seat two Aircrew-men diver and recover two survivors with rescue hoist? Will the helicopter be capable of provisioning Electro Optical/ Infra Red (EO/IR) and search light for undertaking night SAR?  (b) <b><u>Casualty Evacuation (CASEVAC).</u></b> Will the helicopter have a carrying capacity of a minimum of two stretchers with patients and a minimum of one medical attendant? Will the helicopter be capable of provisioning EO/IR for undertaking night CASEVAC?  (c) <b><u>Communication Duties (one role at a time).</u></b> Will the helicopter be capable of undertaking the following missions:-  (i) Carrying a minimum of six passengers seated on passenger seats. or (ii) Carrying a minimum of 420 Kgs of cargo (inside the cabin). or (iii) Carrying a minimum of 500 Kgs load under slung on cargo hook.

<b>Sr</b>	<b><u>Technical Parameters</u></b>
	<p>(d) <b><u>Anti-Piracy and Anti-terrorism.</u></b> Will the helicopter have capability of at least one 12.7 mm machine gun, detachable or fixed light armour protection (at least for cockpit floor or crew seats), 4 commando seats, rappelling installation, and EO/IR system? Will it also have Small Team Insertion Extraction equipment? If yes, what will be its type? What will be the specifications of rappelling installation?</p>
	<p>(e) <b><u>Ship-borne Operations</u></b></p>
	<p>(i) Will the helicopter be capable of operating from ships helo deck by day and night?</p>
	<p>(ii) What would the minimum dimensions of the Helicopter for stowing onboard ship? Will this be achieved by folding of Main Rotor Blades and Tail section?</p>
	<p>(iii) What would be the maximum pitch and roll conditions in which the helicopter is capable of being lashed on the deck of a Frigate size ship?</p>
	<p>(iv) Will all airframe components and detail part be corrosion resistant meeting environmental standards in accordance with Def Stan 00-970 or Def Stan 05-123 or equivalent? Will DO-160E be also applicable for airframe components?</p>
	<p>(f) <b><u>Shore Operations.</u></b></p>
	<p>(i) Will the helicopter be cleared to operate from surface covered with sand and unprepared surfaces with strap-on active and passive sand filters?</p>
	<p>(ii) What would be the maximum slope conditions of helicopter in terms of nose up, nose down and lateral during landing and taking off from shore, when it is not equipped with weapon store carrier?</p>
	<p>(g) <b><u>Availability and Reliability.</u></b> What would be the average availability of helicopter and reliability of Sensor Performance?</p>
	<p>(h) <b><u>Certification/Qualification.</u></b> Will the helicopter be certified or qualified for military operations prior to delivery? Will the equipment and its payload be qualified or certified for airborne operations as per latest Mil standards or equivalents?</p>
9.	<p><b><u>Basic Design Features.</u></b> Will the helicopter have the following design features:-</p>
	<p>(a) Capable of operating as independent detachment from remote areas.</p>
	<p>(b) Capable of flying over sea, plains and in hilly regions.</p>
	<p>(c) The helicopter crew configuration of two pilots and one Aircrew man</p>

**COMMERCIAL IN CONFIDENCE**

<b>Sr</b>	<b><u>Technical Parameters</u></b>
	Diver.
	(d) Main Rotor Blades and Tail Rotor Blades of composite material.
	(e) Monitoring system for engine health and airframe usage.
	(f) Provided with Emergency Flotation Gear for exit of aircrew and passengers in case of helicopter ditching over water.
	(g) Clearance available under the helicopter, in case of oleo collapse, for dismounting the torpedo from helicopter.
	(h) Provided with lifting points to enable salvage operations.
	(j) Audio or visual warning available for failure of critical helicopter systems.
	(k) Will the helicopter have crashworthy or crash attenuating features as per FAR 29 amendment 16 or equivalent for following?
	(i) Crew seats, safety belts and harness
	(ii) Fuel Cells
	(iii) Airframe, Transmission System and Engine
	(iv) Cockpit, Cabin And Associated Structures
10.	<b><u>Power Plant</u></b>
	(a) <b><u>Requirement.</u></b> Will the helicopter meet following: -
	(i) Dual channel cross talking FADEC (Full Authority Digital Engine Control) or Electronic Engine Control (EECs). Will the engine be controllable in case of failure of one FADEC or EEC?
	(ii) Self contained starter system without usage of external power when operating from Advanced Landing Grounds.
	(iii) OEI training mode is available.
	(iv) Engines are interchangeable.
	(v) Corrosion resistant engine oil. Oil equivalent substitutes be readily available in Indian or international market.
	(vi) No requirement of external supply for starting.
	(b) <b><u>Contingency Power Rating</u></b> {Applicable under One Engine Inoperative (OEI) Conditions}.
	(i) Will the contingency rating be provided in the event of a single engine failure?
	(ii) Will the OEI level flight be possible at 95% max AUW?
	(iii) Will there be a positive indication to the pilot when any contingency rating is being used?
	(c) <b><u>Maximum Power Rating (TOP-AEO).</u></b>
	(i) Will the helicopter be available continuously for a period of at least 5 minutes?
	(ii) Will the engine not require any examination after use of this power rating within the defined limits?
	(iii) Will the maximum continuous rating be available?
11.	<b><u>Fuel System.</u></b> What are the types of fuel that can be used to operate helicopter? Will the fuel system of helicopter have the following features: -
	(a) Closed circuit type.
	(b) Capability for gravity fuelling and defueling.

**COMMERCIAL IN CONFIDENCE**

<b>Sr</b>	<b><u>Technical Parameters</u></b>
	(c) Capability to return to and execute safe landing on a ship and air strip in case of a One Engine Inoperative (OEI) condition after Take Off at 95% of Maximum Gross weight (either by fuel jettison or reserve of engine power or combination).
	(d) Facility of low level warning.
12.	<b><u>Flight Controls.</u></b>
	(a) Will it be provided with dual digital 4-axis Automatic Flight Control System with redundancy?
	(b) Will the helicopter be airworthy and controllable in case of auto pilot failure?
	(c) Will the helicopter have Automatic height control and autonomous/independent Plan Position control in hover?
	(d) Will it offer no resistance to pilot initiated override manoeuvres?
	(e) Will the helicopter have Autopilot coupled modes for navigation, search patterns, coupled approaches to airfield and ships and transition down to hover at designated location and heights?
	(f) Will the helicopter have Automatic Height Hold?
	(g) Will the autopilot be capable of autonomous hover over land and sea including autonomous transition to hover from cruise flight?
13.	<b><u>Gear Box</u></b>
	(a) Will the helicopter be capable to dry run for at least 30 min?
	(b) Will gear box be corrosion resistant?
	(c) Will the oil equivalent substitutes to be readily available in Indian / International market?
	(d) Will gearboxes be provided with suitable means for detecting internal metal particles while in flight?
14.	<b><u>Undercarriage</u></b>
	(a) Will the helicopter be fitted with a crashworthy wheeled landing gear as per FAR/DEFSTAN standards or equivalent?
	(b) Will it be designed to withstand landing rate on a ship as per Federal Aviation Regulations (FAR)/ Defence Standards (DEFSTAN) standards or equivalent related for ship operation?
	(c) Will Damping be provided to preclude ground resonance?
	(d) If the undercarriage is retractable, will following be available?
	(i) Landing Gear Monitoring facility and warning light.
	(ii) Emergency system in the event of failure in hydraulic/electrical systems to allow extension and locking of landing gear.
	(e) Will Suitable Parking brake system be used even when the helicopter is in switched off condition? Can it be recharged without need to start helicopters?
15.	<b><u>Rotor System</u></b>
	(a) Will the main rotor blades of helicopter be foldable for storage and transportation and have a folding mechanism? Will the blade folding mechanism conform to the following:-
	(i) Operate from <b>IN</b> ships capable of carrying helicopter by day and night.

**COMMERCIAL IN CONFIDENCE**

<b>Sr</b>	<b><u>Technical Parameters</u></b>
	(ii) Able to be operated with a maximum of 04 ground personnel in maximum 10 minutes in Primary mode.
	(b) Will Rotor brakes be provided?
	(c) Will the MRB be damage tolerant?
16.	<b><u>Cockpit and Cabin.</u></b> Will the helicopter have following features:-
	(a) Glass cockpit with multi function colour mission displays.
	(b) Multi Function Displays (MFD) is sunlight and Night Vision Goggle (NVG) readable and having facility to exchange information between displays.
	(c) Will the helicopter be flyable and able to return back to base in case of glass cockpit display failure?
	(d) <b><u>NVG compatible.</u></b> Will it be equipped with suitable panel and cabin lighting compatible with NVG higher than Generation (GEN) III? Will internal and external lighting be compatible with Generation (GEN) III or better quality NVGs? Will the helicopter be able to undertake operations with and without NVGs?
	(e) Will all crew doors be jettisonable? Will other doors and windows have facility for emergency egress?
17.	<b><u>Equipment Fit.</u></b> Will the avionics equipment, navigation suite and onboard sensors be of standard aeronautic open system architecture based on Commercial off the Shelf (COTS) technology?
18.	<b><u>Internal Communication</u></b>
	(a) Will all internal and external communications be routed through the Internal Communication System (ICS)?
	(b) Will the pilots be able to make external communication whilst on flying controls?
	(c) Will at least one head set jacks of ICS for all passengers (six) exist?
	(d) <b><u>Intercom.</u></b> Will the intercom be capable of providing audio inputs from all communication sets to all stations in the helicopter?
19.	<b><u>External Communication.</u></b> Can the helicopter be provided with two communication sets in combined VHF & UHF band (with guard frequencies) and one set in HF band? Will these sets be provided with Maritime Mobile Band frequencies? In addition, will it have following minimum capabilities?
	(a) <b><u>Communication Set (VHF and UHF).</u></b> Will the communication set be provided with following:-
	(i) <b><u>Built In Test Facilities.</u></b> Power ON, Periodic and Initiated BIT facilities.
	(ii) <b><u>Preset Channels.</u></b> At least twenty operator settable channels. Channels capable of being preset in air and on ground? Capable of settable when powered by ground supply?
	(iii) Controllable from the cockpit by pilots.
	(iv) Adaptable to user provided Speech Secrecy Equipment?
	(v) <b><u>Squelch Facility.</u></b> Operator selectable and tunable squelch facility?
	(b) <b><u>High Frequency (HF).</u></b> Will one HF modern modular digital set meet following specifications?
	(i) Voice AM (H3E) Suppressed carrier.

**COMMERCIAL IN CONFIDENCE**

<b>Sr</b>	<b><u>Technical Parameters</u></b>
	(ii) Adaptability to user provided Speech Secrecy Equipment.
20.	<b><u>Direction Finder.</u></b> Will it have following capabilities? (a) Software defined design to receive at least following international distress frequencies :- (i) 121.5 MHz and COSPAS-SARSAT (406 MHz) (ii) ARGOS, AIS and Digital Selective Calling (DSC) encoded beacon signals. (b) Frequency range - 30 to 407 MHz (c) Bearing intrinsic accuracy < 4°, Bearing accuracy at the sensitivity limit < +6%.
21.	<b><u>Radar (Max weight – 40 Kgs).</u></b> Will it have better facility than mentioned below:- (a) Capability of indicating weather cell in colour on a digital display to enable penetration. (b) Will the radar be able to detect surface targets as follows:- (i) 10 m <sup>2</sup> target (small boat) - detection range at least 12 nm at 3000 ft helicopter flight altitude. (ii) 100 m <sup>2</sup> target (small ship/Fast Patrol Boat) - Detection range at least 20 nm at about 3000 ft helicopter flight altitude. (iii) 1000 m <sup>2</sup> target (Frigate) - Detection range at least 30 nm at about 3000 ft helicopter flight altitude.
22.	<b><u>Automatic Identification System (AIS) Receiver.</u></b> Will AIS receiver be provided? Will the received data be capable of being viewed in cockpit on MFD? What will be the class of AIS receiver? Will it be certified for aeronautical use?
23.	<b><u>IFF Transponder.</u></b> Will the helicopter have IFF Transponder? What will be its capability/ technical specifications?
24.	<b><u>Air Conditioning.</u></b> Can the air-conditioning be provided in the cockpit to maintain the requisite atmospheric conditions suitable for optimum functioning of equipment?
25.	<b><u>Self Sealing Fuel Cells.</u></b> Will the self-sealing protection be available on fuel tanks?
26.	<b><u>FDR, CVR and ELT.</u></b> Will the helicopter be fitted with a solid state combined Flight Data Recorder (FDR) and Cockpit Voice Recorder (CVR) with a deployable Emergency Locator Transmitter (ELT)? What would be the data recording duration for FDR and CVR? Will Data downloading, reading and playing facility to be provided? What would be the operation capability of Underwater Locator Beacon?
27.	<b><u>Self Protection Suite (SPS)</u></b> (a) Will the Self Protection Suite (SPS) system include Radar Warning Receiver (RWR), Missile Approach Warning System (MAWS) and Counter Measure Dispensing System (CMDS)? Will the prime contractor be responsible for installation and integration of the system? (b) Will the RWR have frequency coverage from 1 to 40 GHz with data capture and downloading facility? Will it provide capability to activate / trigger the onboard CMDS? Will the system have the capability for generating coarse DF for radar intercepts and facility for Post Mission Analysis (PMA)? Will it have Built in test equipment? Audio and video warning against emitters

<b>Sr</b>	<b><u>Technical Parameters</u></b>
	categorised as 'Threat'. What will be the spatial and azimuth coverage with four antennas? Will it have following features:-
	(i) Spatial coverage 360° Azimuth over the full frequency range.
	(ii) Optical Digital Receiver, emitter identification, simultaneous CW handling capability and DF performance.
	(iii) Full colour threat display as well as audio signals.
	(iv) Built in test capability.
	(v) User definable threat symbology.
	(vi) Flight line software upload/download via external data loader interfaces.
	(vii) Configurable secure modes of operation in terms of operational software and libraries.
	(viii) Post Mission Playback and analysis facilities by means of Flight Data Analyser.
	(ix) Electronic Warfare Data Management System.
	(c) Will the MAWS have following features:-
	(i) Inhibit warning against diverging missiles.
	(ii) Spatial coverage of 95° conical per sensor or better and have 360° Az and full spherical coverage. What will be the weight of each sensor and the receiver?
	(iii) Will the MAWS have <b>Dual Colour IR based neutral net classifiers</b> using both temporal and accurate spatial information as well as compensation of own platform movement as an enhanced feature?
	(d) Will the CMDS be modular, fully programmable and capable of dispensing both chaff and IR flares? What will be the dimensions of these flares? What will be the components of CMDS? Will it have automatic, semi-automatic and manual modes of dispensation? Will it have following capabilities?
	(i) User programmable dispensing sequence.
	(ii) Payload mix recognition, misfire detection and compensation.
	(e) As an enhanced feature, will the helicopter have following:-
	(i) Multi band coverage ( Bands I, II, III, optional IV)?
	(ii) Multi threat handling with Laser beam rider (LBR), Laser range finder (LRF) and Laser target designator (LTD)?
	(f) Will Quick erase facility be available for the data stored in the storage media?
28.	<b><u>Navigation.</u></b> What will be the type of navigation system? Will the aircraft navigation system have the following specifications?
	(a) At least one of the onboard navigation systems capable of stand-alone operation.
	(b) One of the hybrid navigation systems be Satellite based Global Positioning System.
	(c) Redundancy to allow safe and accurate navigation in the event of failure of internal avionics or inputs from external sources.
	(d) The navigation system coupled with the autopilot providing accurate hover for prolonged duration over sea.
	(e) The helicopter fitted with a Radio/ Radar Altimeter (RADALT).



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<b>Sr</b>	<b><u>Technical Parameters</u></b>
	(f) Will the avionics system include Instrument Landing System (ILS), VHF Omni Directional Radio Range (VOR), Distance Measuring Instrument (DME) and Radio Magnetic Indicator (RMI)?
29.	<b><u>Performance</u></b> . Does Hover out of Ground Effect (HOGE) be considered for hover performance and all take-offs and landings?
30.	<b><u>Payload</u></b> . Will the helicopter at sea level be able to carry following minimum payloads, with capability to carry one combination at a given time, with two pilots and one air crew diver on board? (a) Six passengers (seats for passengers be provided as detachable equipment on all helicopters) or (b) Internal load of at least 480 kg, or (c) Carriage of under slung load of at least 500 kg, or (d) Two stretchers with one patient each and at least one medical attendant.
31.	<b><u>Speeds</u></b> . Will the helicopter be able to achieve the following speeds at maximum AOW:- (a) The continuous cruise Indicated Air Speed (IAS) at sea level not be less than 125 knots. (b) Velocity Never Exceed (VNE) at sea level not be less than 135 knots.
32.	<b><u>Service Ceiling</u></b> . Will Service ceiling of the helicopter be above 10000 feet pressure altitude?
33.	<b><u>Range and Endurance</u></b> . Will the helicopter be able to meet the following range and endurance with the fuel reserve of 15% or 20 minutes, whichever is more:- (a) What would be the maximum range of the helicopter with two pilots and one aircrew man diver in SAR configuration? (b) <b><u>Search and Rescue</u></b> . Fill the following :-  HOGE and take off from Sea Level with two pilots and one aircrew man diver, proceed to at least _____ nm from ship at best cruise speed, loiter for at least _____ minutes including HOGE for _____ min in search area and return to land on the ship with at least two rescued members? (c) <b><u>Casualty Evacuation (CASEVAC)</u></b> . Fill the following :-  HOGE with two pilots, one medical attendant and two patients in Ambulance Configuration, proceed at least _____ nm from ship at best cruise speed at 1000 feet altitude to land on shore or ship? (d) <b><u>Communication Duties</u></b> . Fill the following :- (i) <b><u>Passenger</u></b> . HOGE at sea level with two crew members, at least four passengers at sea level, fly at 1000 feet pressure altitude to land at another ship / base at a distance of not less than _____ nm? (ii) <b><u>Internal Load</u></b> . HOGE at sea level with three crew members and at least 420 Kgs internal weight at sea level, fly at 1000 feet pressure altitude to land at another ship / base at a distance of not less than _____ nm? (iii) <b><u>Cargo</u></b> . HOGE at sea level with two pilots and one aircrew diver and

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<b>Sr</b>	<b><u>Technical Parameters</u></b>
	at least 420 Kg under slung at sea level, fly at 1000 feet pressure altitude to land at another ship / base at a distance of not less than _____ nm?  (e) <b><u>Maritime Reconnaissance and Targeting Mission</u></b> . With two pilots and one light weight torpedo, will the helicopter be able to HOGE and take off from sea level, proceed at least _____ nm from the ship at cruising speed, deploy the payload and return back to ship?
34.	<b><u>Maneuverability</u></b> (a) Will the helicopter be cleared for operations up to instantaneous load factors of at least +2g and -0.2 g at sea level? (b) Will the helicopter be able to execute turns in level flight at bank angles of up to 45 deg at 85% of maximum AUW at sea level?
35.	<b><u>Sideward and Rearward Flight</u></b> . Fill the following :-  At 90% of its maximum AUW, will the helicopter be able to execute sideways and rearward flight up to at least _____ knots and at least _____ knots respectively at sea level with directional control?
36.	<b><u>Turns on the Spot</u></b> . Will the helicopter be able to turn on the spot to either side at a rate not less than 30 deg per second at 90% of maximum AUW?
37.	<b><u>Quick Stop and Hover</u></b> . From cruise speed at maximum AUW and Centre of Gravity (CG) at maximum permissible forward and rear positions, will it be possible to execute a level flight quick stop and hover?
38.	<b><u>Centre of Gravity</u></b> . Will the helicopter be able to achieve maximum forward speed in level flight throughout its operating envelope within maximum permissible CG limits?
39.	<b><u>Safety Features</u></b> (a) Will the rotor have sufficient inertia and aerodynamic capability to execute safe touchdown with full directional control at maximum AUW in power off conditions? (b) Will the rotor design ensure that in the event of an engine failure, rotor speed decay allows for normal pilot reaction time before the collective is lowered to the flat pitch? (c) Will the helicopter be easily controllable in autorotation from zero speed to maximum permitted speed in autorotation? (d) Will loss of power of one engine not produce abnormal attitude changes? (e) Will the engine have back up control system to take care of the failure of primary engine control system? (f) Will there be any cross-feed system in case of one engine failure?
40.	<b><u>Night Capability</u></b> . (a) Will the helicopter be capable of night operations from all ships capable of operating helicopters by night? Will it be equipped with internal and external lighting? (b) Will both the internal and external lighting system be compatible of NVG and non-NVG operations simultaneously?

**COMMERCIAL IN CONFIDENCE**

<b>Sr</b>	<b><u>Technical Parameters</u></b>
	(c) Will landing light be steerable to allow for different types of approach and landing?
	(d) Will searchlight be capable of operating in the visual and IR spectra?
41.	<b><u>Rescue Hoist.</u></b>
	(a) Will there be provision for fitment of rescue hoist available on the helicopter?
	(b) What would be the minimum load capacity of the rescue hoist?
	(c) what would be the minimum usable cable length?
42.	<b><u>Cargo Hook.</u></b>
	(a) What would be the lifting capability of cargo hook?
	(b) Will there be provision for fitment of cargo hook on all helicopters?
43.	<b><u>EO/IR FLIR.</u></b> Will the Forward Looking Infra Red (FLIR) have following capabilities:-
	(a) <b><u>Field of View (FOV).</u></b> HDIR (thermal imager) - 2° to 40° continuous zoom. At least 1° with EFL (extender) and minimum additional 2 x electronic zoom.
	(b) Colour CCD camera with a detector of at least 1280 x 720 pixels, optical zoom of at least 2°- 37°, zoom of at least 2x and sensitivity at least 0.5 lux.
	(c) Controlled through own handgrip and capable of being connected to radar, MFD and Global Positioning System (GPS).
	(d) Laser Range Finder (LRF) and Quick disconnect device.
	(e) Will it be able to detect Fast Patrol Boat and Merchant Vessel? What will be its size for trial purpose?
	(f) Minimum range at ambient temperature 25°C and RH 80% as follows:-
	(i) <b><u>Fast Patrol Boat</u></b> - Detection - _____ Nm , Recognition - _____ Nm
	(ii) <b><u>Merchant Vessel</u></b> - Detection - _____ Nm , Recognition - _____ Nm
	(g) What is the weight of turret assembly of EO/IR FLIR?
	(h) Will the prime contractor be responsible for installation and integration of the equipment and for interfacing it with radar?
44.	<b><u>Gun</u></b>
	(a) Will the helicopter be able to carry (along with firing mechanism) and fire from one 12.7 mm machine gun in anti terrorism / anti piracy role?
	(b) Will the prime contractor be responsible for installation and integration (as removable fittings iaw the role) of 12.7 mm machine gun along with firing mechanism and associated equipment, so as to achieve firing of gun from the helicopter?
45.	<b><u>Helmet Mounted Display System (HMDS).</u></b> Will tthe helicopter be provisioned with Hhelmet Mounted Display System (HMDS) along with NVG? Will HMDS have following capability:-
	(a) Both day and night flying capability

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<b>Sr</b>	<b><u>Technical Parameters</u></b>
	(b) Synthetic 3D symbology  (c) NVG at least Gen III or equivalent
46.	<b><u>Camera</u></b> . Can a suitable hand held camera having video and still capture facility operable from the cockpit and crew cabin with facility of storage (holder) in the cockpit provided? Will the camera be of contemporary technology and have features equal to or better than the following? (a) Optical and digital zoom capabilities as provided by 600 mm telephoto lens or tele converter. (b) Resolution better than 20 mega pixel. (c) Storage media in excess of 64 GB. (d) Facility for capturing snap shot with date, time and GPS position embedded. (e) Facility for extraction of captured video and still pictures on a COTS desktop (laptop) computer (with windows 8.1 or higher OS).
47.	<b><u>Maintenance</u></b> . Will the following QRs in aid of Maintenance, Quality Assurance and Product support be met:- (a) All external electrical supply and fuelling connectors / couplings are of standard NATO type. (b) Access panel for facilitating front line servicing fitted with quick release fasteners to facilitate front line maintenance. To reduce the chance of FOD, captive fasteners be provided in access panels. (c) The entire system to have total electro-magnetic compatibility with all equipment onboard the helicopter. EMI-EMC, including for system power supply, conform to iaw MIL STD 461F / 464 or latest FAR or equivalent. (d) Software standards as per IEEE 12207. Software configuration management procedures for upgrades are specified.
48.	<b><u>Obsolescence Management</u></b> . What is obsolescence management plan for ensuring that the delivered helicopters are of latest make? Would the company be in a position to ensure that the sensors/systems of helicopter do not become obsolete for a minimum period of 7 years?
49.	<b><u>Test Equipment</u></b> . (a) Provide the list of equipment having BITE facility. (b) Provide the list of equipment that would have inbuilt capability of carrying out system checks after defect rectification or parts replacement. Also indicate the systems and equipment having online and offline modes of fault detection and localisation including BITE facility.
50.	<b><u>Range/Endurance - Limited Sub Surface Targeting Mission</u></b> . Will the helicopter in the Fully Configured Version be able to HOGE and take off from sea level with two pilots and under-slung load of one light weight torpedo, proceed at least 30 nm from the ship at cruising speed and deploy the payload and return back to ship with 20 min reserve of fuel?
51.	<b><u>Weapon for Sub Surface Targeting</u></b> . Will the helicopter in Fully Configured Version be able to carry (along with firing mechanism and attack associated

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<b>Sr</b>	<b><u>Technical Parameters</u></b>
	equipment) and fire at least one light weight Anti Submarine Torpedo for sub surface?
52.	<b><u>Radar.</u></b> Will the radar (Maximum weight – 60 Kgs) on fully configured version, be able to meet at least following? Fill the following :- (a) Radar Cross Section (RCS) criteria: - (i) 1 m <sup>2</sup> target (small boat) - detection range at least ____ nm at 3000 ft helicopter flight altitude. (ii) 10 m <sup>2</sup> target (small boat) - detection range at least ____ nm at 3000 ft helicopter flight altitude. (iii) 100 m <sup>2</sup> target (small ship/Fast Patrol Boat) - Detection range at least _____ Nm at about 3000 ft helicopter flight altitude. (iv) 1000 m <sup>2</sup> target (Frigate) - Detection at least _____ nm for Fully Configured version at 3000 ft helicopter flight altitude. (b) Weather observation with no detection performances degradation. (c) Auto tracking & AIS correlation. (d) Auto target classification while scanning.
53.	Will Vibration monitoring and warning system be provided in fully configured version of helicopter?
54.	<b><u>Communication.</u></b> Will the communication sets in fully configured version be able to meet at least following:- (a) Software Defined Radio (SDR) technology architecture with three channels, two in VHF & UHF band and one in HF band with Mercantile Mobile Band coverage. What will be the frequency range of sets, power output and carrier modulation? (b) Carrier Modulation - AM,ASK,FM,MSK,CPM,D8PSK,SOQPSK (c) Adaptable to user provided Speech Secrecy Equipment. (d) Software reprogrammable in the field via Memory loader/verifier Software. (e) Multi-waveform software architecture. (f) Compatible with ICAO Annex 10 and ED-23B, including FM immunity.
55.	What is the sea state to which helicopter with Emergency Floatation Gear (EFG) will be stable without capsizing?
56.	Which are the helicopter systems with warning facility? What are the types of warning system available to indicate the failures of these systems?
57.	<b><u>Traversing System.</u></b> Will the adaptable traversing system be available on the helicopter? Alternately, can the helicopter be made adaptable to traversing gear onboard ship?
58.	<b><u>Simulator.</u></b> Can the OEM provide helicopter simulators with following features:- (a) <b><u>Flight simulator.</u></b> 'Full Motion Full Mission Flight Simulator' of level D fidelity meeting the NSQRs of NUH along with requisite complex. (b) <b><u>Maintenance simulator.</u></b> 'Maintenance Simulator' along with requisite complex for undertaking maintenance practises as per the NUH maintenance

<b>Sr</b>	<b><u>Technical Parameters</u></b>
	schedule for 'O' and 'I' level.

<b><u>AIRBORNE LIGHT WEIGHT TORPEDO FOR NUH</u></b>																												
59.	Which all torpedoes will be compatible to NUH?																											
60.	<b><u>General Capabilities.</u></b>																											
	(a) <b><u>Launch Platforms.</u></b> Will the torpedo be capable of being launched from the NUH?																											
	(b) <b><u>Description.</u></b> Fill the following regarding dimensions of torpedo :-																											
	<table border="1" style="margin-left: 40px;"><thead><tr><th style="text-align: center;"><b><u>Ser</u></b></th><th style="text-align: center;"><b><u>Parameter</u></b></th><th style="text-align: center;"><b><u>Value</u></b></th></tr></thead><tbody><tr><td style="text-align: center;">(i)</td><td>Diameter</td><td></td></tr><tr><td style="text-align: center;">(ii)</td><td>Length</td><td></td></tr><tr><td style="text-align: center;">(iii)</td><td>Weight</td><td></td></tr><tr><td style="text-align: center;">(iv)</td><td>Speed</td><td></td></tr><tr><td style="text-align: center;">(v)</td><td>Range (low speed)</td><td></td></tr><tr><td style="text-align: center;">(vi)</td><td>Range (high speed)</td><td></td></tr><tr><td style="text-align: center;">(vii)</td><td>Operating depth</td><td></td></tr><tr><td style="text-align: center;">(viii)</td><td>Minimum water depth Air launch</td><td></td></tr></tbody></table>	<b><u>Ser</u></b>	<b><u>Parameter</u></b>	<b><u>Value</u></b>	(i)	Diameter		(ii)	Length		(iii)	Weight		(iv)	Speed		(v)	Range (low speed)		(vi)	Range (high speed)		(vii)	Operating depth		(viii)	Minimum water depth Air launch	
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(viii)	Minimum water depth Air launch																											
	(c) <b><u>Variants.</u></b> Will the torpedo have the following variants:-																											
	(i) <b><u>Combat</u></b> .Live, explosive-filled article, in negatively buoyant configuration																											
	(ii) <b><u>Exercise.</u></b> Non-explosive self-propelled article with performance recording devices and in positively buoyant recoverable configuration along with suitable recovery aids. Will the exercise head employ an inflatable collar for recovery?																											
	(iii) <b><u>Drill and Practice.</u></b> Inert un-propelled positively buoyant article that can be air-launched																											
	(d) <b><u>Other Capabilities.</u></b> -																											
	(i) Will the Torpedo be capable of detection and classification and engaging of submarines coated with anechoic materials, and transiting at less than 4 knots?																											
	(ii) Will the Torpedo have a high probability of hit (above 80 per cent) in torpedo countermeasure environment?																											
	(iii) Will the Torpedo be capable of navigating to ensure target acquisition with more than 50% probability, at 70% of the maximum engagement range of the torpedo?																											
	(iv) Will the Torpedo be guarded against bottom seduction?																											
61.	<b><u>Target Detection Capability.</u></b> What is the maximum acquisition range of Torpedo in active mode for submarine, in Isothermal conditions?																											
62.	<b><u>ACCM Capability.</u></b> Will the torpedo have the ACCM feature of Decoy Classification?																											
63.	<b><u>Homing System</u></b>																											
	(a) <b><u>Mode.</u></b> Will the homing system have Active, Passive and Mixed mode?																											
	(b) <b><u>Search Patterns.</u></b> Will the torpedo have suitable search, attack and re-																											

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	attack patterns, effective in both shallow and deep waters? Will it have a multi-pattern lost contact search, selected autonomously based on the geometry of target motion parameters? Will the pattern be such as to achieve full coverage in vertical plane and optimum coverage in azimuth?
64.	<b>Warhead.</b> Will the torpedo warhead possess the following features:- (a) <b>Safety.</b> Multiple safety features incorporated in the Warhead, including features to safe guard the firing platform. Further, the warhead be designed to be safe during depot stowage, transportation and onboard stowage on ships, helicopter and shore station. (b) <b>Initiation.</b> The initiation of the warhead is facilitated either by contact or by the action of a proximity fuse.
65.	Will following presetting be possible? (a) Search Mode (On Top/ Initial Straight Run). (b) Ceiling Depth, Floor Depth and Search Depth. (c) Initial Straight Run. (d) Initial Search Course.
66.	<b>Quality Assurance.</b> Will the OEM provide MQAP giving detail of quality assurance/ control? Will the OEM provide detail of qualification tests undertaken on torpedo?
67.	<b>Special &amp; Test Equipment.</b> Will all special & Test Equipment (S&TE) for Combat and Exercise torpedo be provided?
68.	<b>Exercise Head.</b> Will the Exercise Head have the following features:- (a) The same dimensions as the warhead section. (b) Fitted with a digital recorder to record the torpedo, environmental and homing parameters, required for firing analysis. Having system for analyzing the torpedo performance, after the firing, without disassembling the torpedo. (c) Inflatable collar system to achieve positive buoyancy at the end of the run, and localizing devices for recovery of torpedo.
69.	<b>Reliability.</b> (a) Will no onboard maintenance/testing required on the torpedo, after issue from the depot? (b) What would be onboard life of a fully prepared torpedo? (c) What would be maximum number of firing possible of the Exercise Head? (d) What will be the maximum shelf life of torpedo? What will be the maximum period for which life extension can be accorded?
70.	<b>Flight in Air Material (FIAM).</b> Will there be a requirement of separate FIAM?
71.	<b>Torpedo Simulator.</b> Can a simulator be provided along with the torpedoes? Will the torpedo simulator be capable of simulating all operations and capability of torpedo for training of crew? What would be the simulators capability/ characteristics?
72.	<b>Operating Conditions.</b> Will the torpedo be capable of being launched and operated successfully under the following environmental conditions? (a) Sea Water temperature range - 0 deg C to 34 deg C (b) Sea State - Up-to 5/ equivalent
73.	<b>Environmental Qualifications.</b> Will the torpedo and associated components be capable of withstanding vibration, shock and corrosion, as required for

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	marine equipment, adhering to the followings specifications:- (a) Environmental conditions as per MIL STD – 810F or MIL STD 18404-T or its equivalent. (b) Software standards as per IEEE 12207. Software configuration management procedures for upgrades to be specified. (c) Will the entire system have total electro-magnetic compatibility with all equipment onboard the helicopter? Will EMI-EMC, including for system power supply, conform to iaw MIL STD 461E or 464 or latest DO 160 or equivalent?
74.	<b><u>Safety Aspects</u></b> (a) <b><u>Static Current.</u></b> Will the torpedo be equipped with a provision to discharge High Current and ensure safety of the torpedo from static current? (b) <b><u>Emergency Jettisoning.</u></b> Will it be possible to carry out selective and simultaneous jettison of the loaded torpedo with the warhead and fuses rendered safe without endangering the launch platform?
75.	<b><u>Handling Equipment.</u></b> Will all equipment required for handling, loading /unloading on the launch platform be provided? Will all base and depot handling equipment be provided?
76.	<b><u>Pre-setter.</u></b> Will there be requirement of separate pre-setter? If yes, then what will be its characteristics?
77.	<b><u>Standards and Specifications.</u></b> What will be the standards to which the design, development, operations and maintenance of the torpedo be certified?

78. Can the delivery schedule of NUH be earlier than indicated below (T0 is the date of signing contract):-

<b><u>Sr</u></b>	<b><u>Production Component</u></b>	<b><u>Time Period in months</u></b>	<b><u>No of Helicopter/ Spare Engines</u></b>	<b><u>Additional Equipment</u></b>
(a)	Buy	T0 + 24 to T0 + 48	10 Basic Variant & 5 spare engines	01 Flight Simulator and 01 Maintenance Simulator <i>along with required Test Equipment / Spares / and Documentation.</i>
(b)	Buy	T0 + 49 to T0 + 60	5 Basic Variant & 2 spare engines	Along with required Test Equipment / Spares / and Documentation.
(c)	Make	T0 + 61 to T0 + 72	10 Fully Configured & 5 spare engines	Along with required Test Equipment / Spares / and Documentation.
(d)	Make	T0 + 73 to T0 + 84	10 Fully Configured & 5 spare engines	01 Flight Simulator <i>along with required Test Equipment /</i>



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				<i>Spares / and Documentation.</i>
(e)	Make	T0 + 85 to T0 + 96	12 Fully Configured & 6 spare engines	Along with required Test Equipment / Spares / and Documentation.
(f)	Make	T0 + 97 to T0 + 108	- do-	-do-
(g)	Make	T0 + 109 to T0 + 120	- do-	-do-
(h)	Make	T0 + 121 to T0 + 132	- do -	-do-.
(j)	Make	T0 + 123 to T0 + 144	14 Fully Configured & 7 spare engines	-do-
(k)	Make	T0 + 149 to T0 +156	14 Fully Configured & 8 spare engines	-do-

79. **Additional Information**

(a) Any other relevant information on capability of performing the roles, additional roles possible and maintenance philosophy may also be specified. Vendors are to attach detailed technical specifications and literature of the equipment being offered as response to this RFI.

(b) What functionality/capability does your product offer that is not mentioned in the important characteristics and features mentioned herein may also be brought out.

(c) What features or other factors does your product have that in your opinion make it the most competitive may be indicated.

(d) What kind of Governmental and Commercial clearances/licenses will be required both by the vendor and the OEM in case of products including Ground Support Equipment (GSE), Ground Handling Equipment (GHE), testers & tools and its product support be also indicated.

**ToT REQUIREMENTS – NAVAL UTILITY HELICOPTERS**

1. **Key Technologies**. MoD desires that at least following key technologies are transferred to Indian companies in India:-

<b><u>Sr</u></b>	<b><u>Description of Technology</u></b>	<b><u>Proposed Technical Gate (Minimum Qualifying Technology)</u></b>
(a)	Rotor Blades & associated systems-Including Main & Tail Rotor assemblies, Blade Folding System, Fluid Elastic Dampers, Elastomeric Bearings and associated system.	(i) Methodology/ know how and know why for following:-  (aa) To undertake the design and manufacturing of the rotor blade for enhancing lift and reduction of noise and vibration. The manufacturer should be capable to undertake modifications to achieve suitable design for Helicopter. The manufacturer should be capable to establish repair technologies.  (ab) To configure rotor hub for blade folding. The required technology would allow the Indian design agency to design blades and rotor hub to enable folding of blades.

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<b><u>Sr</u></b>	<b><u>Description of Technology</u></b>	<b><u>Proposed Technical Gate (Minimum Qualifying Technology)</u></b>
		(ac) To design and manufacture of main rotor damper technologies.  (ad) To enable the manufacturer to undertake electronic balancing of rotor blades.
(b)	Rotating Upper Control System	Methodology/ design know how and know why to enable manufacturing agency to design systems for supporting hinge less rotor blades onto the hub.
(c)	<b><u>Transmission System</u></b> – Including Main, Tail & Intermediate Gear Boxes, Housings, Gears, Drive Shafts and associated Systems.	Methodology, design know-how and know-why for following:-  (i) Manufacturing of the bevel gears.  (ii)To provide emergency lubrication for the minimum period of 30 min.
(d)	Vibration Isolation System	Methodology, design know-how and know-why related to Active/passive devices for vibration reduction/control including rotor fuselage interface, if available in the Helicopter.

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<b><u>Sr</u></b>	<b><u>Description of Technology</u></b>	<b><u>Proposed Technical Gate (Minimum Qualifying Technology)</u></b>
(e)	<b><u>Fuel Tanks</u></b> - Main & Auxiliary Tanks	Methodology, design know-how and know-why for following:-  (i) To manufacture crashworthy rubber tanks using rubber compound which are resistant to fuel as well as capable of leak resistant in case of battlefield damage.  (ii) Manufacturing, tooling & repair technologies for the tanks.
(f)	AFCS	(i) Know-how and know-why about control law algorithms for basic stability augmentation and auto pilot modes.  (ii) Methodology, design know-how and know-why of System Safety analysis.
(g)	Wheeled Landing Gear, Wheel Brake & Parking Brake with capability to operate from ship.	Methodology, design know-how and know-why for the following:-  (i) Designing of retractable Under Carriage system.  (ii) Manufacturing of precision forgings.

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<b><u>Sr</u></b>	<b><u>Description of Technology</u></b>	<b><u>Proposed Technical Gate (Minimum Qualifying Technology)</u></b>
(h)	Hydraulic System LRUs – including Main & Tail Rotor Actuators	Methodology, design know-how and know-why for following:-  (i) To design actuators and hydraulic pumps, which would enable manufacturing and repair of actuators and hydraulic pumps.
(j)	Health & Usage Monitoring System (HUMS)	(i) Methodology, design know-how and know-why to download data from HUMS about the health and usage of all the systems linked with the HUMS.  (ii) Details of types of sensors and recommended location of sensors.  (iii) Details of algorithms to monitor health & usage.  (iv) Details of algorithms for predictions.  (v) Methodology, design know-how and know-why for development of software/algorithms.

2. **Extent of Technologies.** The OEMs are to indicate following:-

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<b><u>Ser</u></b>	<b><u>Key Technology Domain</u></b>	<b><u>Technologies Sought</u></b>	<b><u>Will the capability, Technologies &amp; knowledge be transferred</u></b>	<b><u>Descripti on of Capabilit y Area</u></b>	<b><u>Descripti on of extent &amp; depth of ToT</u></b>	<b><u>Description of specific data, technologies &amp; knowledge transferred</u></b>	<b><u>Remarks</u></b>
(a)	Rotor Blades & associated systems- Including Main & Tail Rotor assemblies, Blade Folding System, Fluid Elastic Dampers, Elastomeric Bearings and associated system.	Methodology/ know how and know why for following for a helicopter:-					
		(i) Design and manufacturing of the rotor blade for enhancing lift, higher speed and reduction of noise and vibration.					The manufacturer should be capable to undertake modifications to achieve suitable design for Helicopter. The manufacturer should be capable to establish repair technologies.
		(ii) Techniques to reduce the compressibility effects on the rotor blade tips.					
		(iii) To configure rotor hub for blade folding.					The required technology would allow the Indian

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							design agency to design blades and rotor hub to enable folding of blades.
		(iv) Design and manufacture of main rotor damper technologies.					
		(v) Blade balancing .					
		(vi) Lightning protection of composite blades.					
		(vii) Analytical techniques for optimization of blade design.					
		(viii) Technology for Manufacture of rotor blades using automated layup techniques.					
		(ix) Closed mould technology for rotor blades manufacture.					
		(x) Rigging technology for rotor system.					

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		(xi) State of the art inspection/ thermal Scanning of Rotor Blades.					
		(xii) Design of rotor system parts for TBO as per Helicopter.					
		(xiii) Technology for elastomeric bearings to achieve required dynamic characteristics.					
(b)	Rotating Upper Control System	Methodology/ design know how and know why to enable manufacturing agency to design systems for supporting hinge less rotor blades onto the hub of the helicopter.					
(c)	Vibration Isolation System	Methodology, design know-how and know-why related to Active/passive devices for vibration reduction/control including rotor fuselage interface, if available in the					



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		Helicopter.					
(d)	Active Vibration Control System	(i) Technology for active vibration control system for helicopters.					
		(ii) Techniques for mapping the vibration pattern on the helicopter.					
(e)	Internal Noise Control	Technology for internal noise reduction including design & manufacture of fire resistant noise blankets.					
(f)	Hydraulic System LRUs – including Main & Tail Rotor Actuators	Methodology, know-how and know-why to design and manufacture of actuators, hydraulic pumps and package.					The required technology would enable manufacturing and repair of actuators, hydraulic pumps and package.

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<b><u>Ser</u></b>	<b><u>Key Technology Domain</u></b>	<b><u>Technologies Sought</u></b>	<b><u>Will the capability, Technologies &amp; knowledge be transferred</u></b>	<b><u>Descripti on of Capabilit y Area</u></b>	<b><u>Descripti on of extent &amp; depth of ToT</u></b>	<b><u>Description of specific data, technologies &amp; knowledge transferred</u></b>	<b><u>Remarks</u></b>
(g)	AFCS	(i) Know-how and know-why about control law algorithms for basic stability augmentation and auto pilot modes.					
		(ii) Design process, development of mathematical model of the helicopter.					
		(iii) Methodology, design know-how and know-why of System Safety analysis.					
(h)	Integrated Self Protection System/ Suite EW	(i) <b><u>Missile approach warning System (MAWS).</u></b> Technology for integration of passive (non-radiating) MAWS capable.					
		(ii) Technology for Laser Warning Receiver (LWR).					
		(iii) Technology for Directional Infra-Red Counter Measure (DIRCOM).					
		(iv) Integration aspects:-					

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		<p>(aa) Technology for Integration of EW processor, MAWS/ RWR, LWR, IR Jammer/ DIRCOM and CMDS.</p> <p>(ab) Automatic initiation of CMDS to dispense flare and chaff.</p> <p>(ac)Threat library management.</p>					
(j)	<b><u>Fuel Tanks</u></b> - Main &	Methodology, design know-how and know-why for following:-					

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	Auxiliary Tanks	(i) To manufacture crashworthy rubber tanks using rubber compound which are resistant to fuel as well as capable of leak resistant in case of battlefield damage.					
		(ii) Manufacturing, tooling & repair technologies for the tanks.					
(k)	<b><u>Transmission System</u></b> – Including Main, Tail & Intermediate Gear Boxes, Housings, Gears, Drive Shafts and associated Systems.	Methodology, design know-how and know-why for following:-					
		(i) Technology for Manufacturing of the bevel gears, housings, lube system of gear boxes to ensure TBO of Helicopter.					
		(ii) To provide emergency lubrication for the minimum period of 30 min.					
		(iii) High strength thin walled Aluminum Investment Castings.					

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(l)	Wheeled Landing Gear, Wheel Brake & Parking Brake with capability to operate from ship.	Methodology, design know-how and know-why for the following:-					
		(i) Designing of retractable Under Carriage system.					
		(ii) Manufacturing of precision forgings.					
(m)	Health & Usage Monitoring System (HUMS)	(i) Methodology, design know-how and know-why to download data from HUMS about the health and usage of all the systems linked with the HUMS.					
		(ii) Details of types of sensors and recommended location of sensors					
		(iii) Details of algorithms to monitor health & usage.					

**COMMERCIAL IN CONFIDENCE**

<b><u>Ser</u></b>	<b><u>Key Technology Domain</u></b>	<b><u>Technologies Sought</u></b>	<b><u>Will the capability, Technologies &amp; knowledge be transferred</u></b>	<b><u>Descripti on of Capabilit y Area</u></b>	<b><u>Descripti on of extent &amp; depth of ToT</u></b>	<b><u>Description of specific data, technologies &amp; knowledge transferred</u></b>	<b><u>Remarks</u></b>
		(iv) Details of algorithms for predictions.					
		(v) Methodology, design know-how and know-why for development of software/algorithms.					
(n)	Engine manufacturing & ROH technologies	(i) Special Coatings for corrosion/ erosion protection, bonding, plasma coatings.					
		(ii) Surface Treatment Technologies.					
		(iii) High temperature coatings.					
		(iv) Linear Friction Welding.					
		(v) Electron Beam Physical Vapour Deposition.					
		(vi) Direct Vapour Deposition.					
		(vii) Laser Shock Peening for highly stressed rotor bores, blade roots and fir tree areas.					

**COMMERCIAL IN CONFIDENCE**

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		(viii) Technologies for NVGs & other Hot end parts.					
		(ix) Manufacture of forging for turbine & compressor discs, blades & vanes.					
		(x) Full Authority Digital Engine Control (FADEC) – control law, hardware and software.					
(p)	Engine development Technologies	(i) Wide chord fan technology.					
		(ii) Single crystal castings & blade manufacturing.					
		(iii) Directionally solidified castings technology.					
		(iv) Lubrication system design for very low oil consumption.					
		(v) Rotor dynamics and vibration technology for twin spool engines.					
		(vi) Measurement of rotor temperature and stress pattern with telemetry.					

**COMMERCIAL IN CONFIDENCE**

<u>Ser</u>	<u>Key Technology Domain</u>	<u>Technologies Sought</u>	<u>Will the capability, Technologies &amp; knowledge be transferred</u>	<u>Descripti on of Capabilit y Area</u>	<u>Descripti on of extent &amp; depth of ToT</u>	<u>Description of specific data, technologies &amp; knowledge transferred</u>	<u>Remarks</u>
		(vii) Measurement of blade vibration using non-contact methods.					
		(viii) Measurement of flame tube pattern factor.					
		(ix) Vibration guides vanes and stator actuation technology including the hydraulic spools and linkages.					
		(x) TiAl (Titanium Aluminide) material technology for HP compressors and LP turbines.					
		(xi) Integrated particle separator for helicopter engine air intakes.					
(q)	Avionics	(i) <b>HMDS</b> : Technology for data processing, graphics processing, high resolution – high accuracy binocular display, optical head, head tracking/ eye tracking system and digital video interface.					
		(ii) Technology for Data Link.					



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		<p>(iii) <b><u>SATCOM</u></b>: Technology for Ku band T/R module, steerable antenna, modem with efficient error correction schemes.</p>					
		<p>(iv) <b><u>Software Defined Radio (SDR)</u></b>:</p> <p>(aa) Technology for direct RF sampling receivers and algorithms, demodulation for burst mode/ TDMA applications, Dynamic TDMA algorithms with minimum overheads.</p> <p>(ab) Efficient forward error correction algorithms.</p>					

**COMMERCIAL IN CONFIDENCE**

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		<p>(ac) Efficient source coding schemes for voice and image data compression.</p> <p>(ad) Miniaturized high power amplifiers .</p>					
		<p><b><u>(v) Terrain Avoidance &amp; Warning System (TAWS):</u></b></p> <p>(aa) Technology for TAWS for helicopters with compliance to FAA Class A requirement</p> <p>(ab) Technology for integration of audio-visual warning for impeding</p>					

**COMMERCIAL IN CONFIDENCE**

<b><u>Ser</u></b>	<b><u>Key Technology Domain</u></b>	<b><u>Technologies Sought</u></b>	<b><u>Will the capability, Technologies &amp; knowledge be transferred</u></b>	<b><u>Descripti on of Capabilit y Area</u></b>	<b><u>Descripti on of extent &amp; depth of ToT</u></b>	<b><u>Description of specific data, technologies &amp; knowledge transferred</u></b>	<b><u>Remarks</u></b>
		terrain with forward looking capability.					
		<p><b><u>(vi) Night vision devices (NVD):</u></b></p> <p>(aa)Technology for aviation grade Night Vision Devices with dual eyepieces.</p> <p>(ab)Technology for integration of these NVDs with avionics package through helmet mounted displays.</p>					

**COMMERCIAL IN CONFIDENCE**

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(r)	Composite Materials & Processes	(i) Development of light weight composite materials with improved material characteristics in terms resistance to abrasion, temperature, corrosion, etc.					
		(ii) Contemporary composite part manufacturing technologies like automated Fibre & ply placement, Resin Transfer Mould (RTM) technology, Collapsible Invar Tooling for Composite Manufacture, out of autoclave curing process, Machining technology for composite parts.					
		(iii) Technology for light weight armour protection.					
(s)	Manufacturing Technologies	(i) Technology for Teflon linear bonding.					
		(ii) Manufacturing of airworthy components using Electron beam plasma Deposition					

**COMMERCIAL IN CONFIDENCE**

<b><u>Ser</u></b>	<b><u>Key Technology Domain</u></b>	<b><u>Technologies Sought</u></b>	<b><u>Will the capability, Technologies &amp; knowledge be transferred</u></b>	<b><u>Description of Capability Area</u></b>	<b><u>Description of extent &amp; depth of ToT</u></b>	<b><u>Description of specific data, technologies &amp; knowledge transferred</u></b>	<b><u>Remarks</u></b>
		techniques. (iii) Thermal Wave imaging techniques. (iv) Contemporary manufacturing technologies including automation of aero structures assembly ( Robotic Drilling & Riveting), automation of final Assembly Line (Equipping), moving lines assembly, Jig-less assembly, High Speed Machining with In-process gauging, on-site NDT techniques					

3. **Description of ToT.** The above mentioned chart is meant to provide details and extent of the capabilities being provided by OEMs of Helicopters. The OEMs are to fill the chart as per following guidelines:-

(a) **Column 1 (Will the Capability, Technologies and Knowledge to be Transferred).** The OEM should mention whether the listed Capability Area/ ToT would be transferred or not.

**COMMERCIAL IN CONFIDENCE**

46

- (b) **Column 2 (Description of Capability Area)**. In this column, the OEM should provide general description and content of the capabilities being transferred.
- (c) **Column 3 (Description of Extent and Depth of ToT)**. In this column, the OEM should specify the depth and to what extent the ToT is being offered for each capability areas. The extent and depth of ToT being provided should enable the Indian Production Agency a long term and self sustained capability.
- (d) **Column 4 (Description of Specific Data, Technologies and Knowledge Transferred)**. In this column, the OEM could provide the following information for each capability area:-
- (i) Specific data and documentation required to enable the ToT transferred to the Indian Production Agency.
  - (ii) List and describe the technologies required to be transferred to enable the ToT

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**Appendix C**

(Refers to Para 10 of NUH RFI)

**GUIDELINES FOR TRANSFER OF TECHNOLOGY**

**NAVAL UTILITY HELICOPTER**

4. MoD, would shortlist Original Equipment Manufacturers (OEM) for helicopters based on the SQRs, Technology Transfer and indigenous roadmap. OEMs having platforms meeting SQR of helicopters need to provide ToT along with the delivery of helicopters. The Naval Utility Helicopters for the Indian Navy are expected to be in the weight category of 5 Tons. The helicopters would primarily operate from ships of Indian Navy.

5. The OEM need to recommend the range, scope and depth of ToT which would enable the Production Agencies/ SPs to manufacture, assemble, integrate, test, install and commission, use, repair, overhaul, support and maintain the helicopters from CKD/SKD/ IM kit. The OEM would be required to provide the latest version of Configuration Control Document which would provide detailed breakdown of the product structure in terms of sensors/subsystems/ assemblies/ sub-assemblies/ modules / detail parts/ PCBs/ wiring diagrams, etc with their latest modification status. All updates as per the 'contract terms' would be provided as and when issued. Consolidated list of updates during the year would have to be provided during the first quarter of subsequent year.

6. **Definitions.** The following would define the scope of ToT:-

(a) **Transfer of Technologies.** It shall mean the quantum and scope of technology being offered by the Buyer and which shall be transferred to the Indian recipient body as part of Buyer Indigenization plan.

(b) **Range.** It shall mean the field (engineering, manufacturing, maintenance) of the Scope of technologies to be transferred.

(c) **Depth.** It shall mean the extent of the Range to be transferred.

**COMMERCIAL IN CONFIDENCE**

(d) **Scope**. It shall mean identification (naming) of the technology.

(e) **Design Technology**. It involves the transfer of design and the knowhow and know why of the equipment. On successful transfer of the technology, the Production Agency (PA) should be equipped with data and knowledge to develop similar products/equipment.

(f) **Manufacturing Technology**. It involves the transfer of required know how and know why for the entire manufacturing process of the particular equipment/ product. On successful transfer of the technology, the PA should be equipped with the requisite data and knowledge to undertake manufacture of similar equipment which may have been designed based on the design technology acquired.

(g) **Transfer of Algorithms**. This would involve the transfer of requisite software, the rationale behind the algorithms and the methods involved in arriving at the particular algorithms.

7. **Product Offering**. The OEMs need to convey in brief and with adequate clarity, their Transfer of Technology (ToT) offer for indigenous manufacture of Helicopter in India towards 'Make in India' initiative of the Government of India.

8. **ToT Requirements**. The Transfer of Technology should meet following requirements:-

(a) ToT should be comprehensive covering design and manufacturing technology.

(b) The technical information provided by OEM should enable the Indian Production Agency (IPA) to manufacture, assemble, integrate, test, install, commission, repair/overhaul, support and maintain the helicopter. In addition, ToT should facilitate obsolescence management, life extension and subsequent integration of sensors/systems and weapons.



(c) At the end of technology transfer process, it is essential to indigenously manufacture the helicopter, which shall be defined based on mutual work-share agreement between the OEM, major sub-contractors of the OEM and the Indian Production Agency.

(d) The extent of Key Technologies, which will be provided, should be indicated along with scope and depth being provided for each technology as per format at Appendix B.

9. The transferred knowledge should contain possibilities for design / development/ sourcing/ integration/ production/ maintenance ('O', 'I', & 'D' levels)/ upgrade, as applicable. Further, it is mandatory that the transferred capabilities/ technologies should be capable of being utilized/ implemented in the ongoing and future indigenous programs.

10. **General Guidelines for ToT.** It is essential to adhere to the general guidelines for ToT provided at **Appendix G** to Schedule I to Chapter II of DPP 2016. The specific requirements listed therein, which would not be feasible, should be clearly brought out in the response to the RFI. In order to facilitate fair assessment of the depth of technology being transferred, OEMs would be required to identify sensors/system/sub-systems under Category 1 to 4. The sensors/ system/ sub-system/ assembly/ sub-assembly/ module/ detail parts classified as category 5 should be listed and the total value of category-5 items as a percentage of the total value of the aircraft must be specified. The definitions of Category 1 to 5 items and the ToT requirements of each category are enumerated in DPP 2016.

11. **Configuration Control.** The OEM would be required to provide the current version of Configuration Control Document to the Indian Production Agency(ies)/Strategic Partner having detailed breakdown of the product structure (helicopter, sensors, sub-systems and support equipment) in terms of the lower level sub-systems/assemblies/sub-assemblies/modules/detail parts/PCBs/wiring diagrams etc with latest modification status. The OEM should provide the data (i.e appropriate procurement identification or nomenclature information) necessary to procure all the components including appropriate sub-vendors identification. All updates during the term of the agreement should be provided as and when issued. Considered list of updates during the year should also be provided during the first quarter of the subsequent year.

12. Design data would have to include the details that the Indian Production Agencies/strategic Indian partners would need to analyse, carryout trouble shooting, give design disposition during the production and exploitation (i.e operational use) of the helicopter, its engine, sensors, system/ sub-systems and accessories on account of snags, deviations, concessions, modification, up-gradation of the product and substitute parts and systems of the product as required by the Indian certifying agency and the Indian Production Agency/Strategic Indian Partner.

13. **Government Approvals.** The OEM would also provide an assurance in the proposal that it would seek all necessary Government export approvals in respect of ToT required for design/development, manufacture, repair/overhaul, upgrade for the helicopter, engines, weapon and sensors, systems and all the components. The OEM would also provide an assurance that all the subsequent governmental approvals needed to allow the OEM to enter into negotiation, sign and execute contracts with the Government of India related to the product would be carried out in a timely manner as and when required. Final export approval should be obtained when contract negotiations are completed, the exact specifications of the product to be supplied have been agreed and Inter-Government Agreement (IGA)/Contract have been signed. At the time of IGA/contract signature, the OEM will present required documents for Gol signature/approval allowing for the implementation of the ToT agreed upon in the IGA/Contract.

14. **Infrastructure Setup.** The OEM would have to include the overall requirement and specifications for the infrastructure set-up required for the satisfactory implementation of the envisaged development, production, tests and maintenance, as applicable. The GSE/GHE, with quantities and all other necessary requirements with specifications, required for implementation of the envisaged development, production, test and maintenance, as applicable, should also be provided to the Indian Production Agency/ Strategic Indian Partner.

15. **Support.** The OEMs would have to provide and support complete ToT for the envisaged development, production, test and maintenance as applicable to the Indian Production Agency/Strategic Partner for the helicopter, sensors and its sub-systems, modules, assemblies and detailed parts/components, including those from sub-vendors. OEM will also be responsible for providing lifetime support for all proprietary items. Availability of support is desirable for a long term with a goal of achieving minimum period of 30 years, beginning after the last helicopter is produced. The OEM would be expected to provide support, and facilitate ToT of the sub-systems from his sub-vendors/OEMs. The OEM should resolve any design deficiency revealed during the operational utilisation of the helicopter in India by the user, which impact stipulated performance.

16. **Sub-assembly Details.** It is likely that some of the assemblies/sub-assemblies/ sensors/ sub-systems and systems are manufactured by OEM's vendors/sub-contractors either based on Engineering documentation provided by the

OEM or developed by the OEM's vendors/sub-contractors which are based on procurement specifications provided by OEM. Detailed list (including procurement information) of such items would have to be provided by OEM.

17. **Proprietary Items**. Certain components/processes specifically developed by the OEMs for use in the manufacture of the helicopter, sensors, its sub-systems and support equipment may be classified 'Proprietary' and not included within the scope of ToT offered to the Indian Production Agency(s). The OEM shall make every effort to minimize proprietary items and if such items are necessary, shall provide details of the nature and scope of the specific items excluded. Further, no item in the product structure which is critical either from the technology point of view or from the point of view of significant value addition or which constitutes a significant relative percentage of the product cost, should be included under the head 'Proprietary items'.

18. **Strategy for Future Capabilities**. The OEM should provide a strategy which describes how the transferred capabilities can be future developed, enhanced and used for other existing and future helicopter programs in India.

19. **Assistance to Indian Production Agency(s)**. OEM shall assist the Indian Production Agency(s)/ Strategic Indian Partner and ensure that maintenance ToT is provided to the maximum extent possible, as required, from his vendor/ sub contractors for items not being provided under ToT.

20. The OEM should permit the Indian Production Agency(s)/ Strategic Partner to sub contract components/ assemblies to its sub contractors. The arrangement of ToT shall be such that the Indian Production Agency(s)/ Strategic Partner are able to procure components/ sub-assemblies/ raw material/ test equipment directly from OEM's sub contractors/ vendors. Exhaustive lists of the OEM sub vendors and the part Numbers of equipment shall be provided by the OEM to the Indian Production Agency/ SP.

21. The option to produce helicopter/ engines/ sensors/ sub systems/ spares for the Indian Armed Forces use, beyond the quantity indicated in the RFI shall rest with the Government of India. The option to export to third country, beyond the Indian requirement, would be subject to agreements with the Government of India and Government of OEM.

22. **Manufacturing Quality Standard Parameters**. The OEM shall provide Manufacturing Quality Standard Parameters (MQSP) details such as Rejection Rate, Rework Rate, Concession Rate, Defect Rate, Quality Escape Rate, MTBF and Failure Rate.

23. **Product Upgrades.** The helicopter OEM would extend full support for technology insertion/ up-gradation/ modification of the helicopter to meet user requirements over the life span of the entire fleet in the Armed Forces inventory. The guidelines would be as follows:-

(a) **OEM Process/ History of Upgrades.** OEM shall describe the process for research and development of future technology insertion and how the Indian Armed Forces can benefit/ influence this process.

(b) **Technical Data Provided for Upgrades.** Technical data, including relevant documentation update, in respect any modifications/ improvements/ upgrades undertaken by OEM in the licensed product during the entire life cycle of the product/ license Agreement, shall be provided to the Indian Production Agency/ SP along with manufacturing data for the same.

(c) **Indigenous Upgrade Capability.** It should be possible to integrate indigenous torpedo, sensors and avionics of Indian/ western/Russian origins. The ToT must include complete design/data/ knowledge to undertake above integration.

24. **Technical Assistance.** As part of ToT, OEM shall provide requisite technical assistance to the Indian software engineers and technicians during the manufacturing program and also during support, repair, overhaul and upgrade of the product.

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**Appendix D**  
(Refers to Para 19 of RFI)

**INFORMATION PROFORMA**

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

\_\_\_\_\_  
(Company profile, 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 submit an undertaking that any subsequent proposal for change in name of firm or address, will be intimated to IHQ MoD(Navy) at the first available opportunity and supporting documents be furnished within five working days of approval by relevant competent authority.

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

Original Equipment Manufacturer (OEM)      Yes/No

Government sponsored Export Agency      Yes/No (Details of registration to be provided)

Authorised Vendor of OEM      Yes/No (attach details)

Others (give specific details) \_\_\_\_\_

3. **Contact Details.**

Postal Address:  
\_\_\_\_\_

City: \_\_\_\_\_ Province: \_\_\_\_\_

Country: \_\_\_\_\_ Pin/Zip Code: \_\_\_\_\_

Tele: \_\_\_\_\_ Fax: \_\_\_\_\_

URL/Web Site: \_\_\_\_\_

4. **Local Branch/Liaison Office/ Authorised Representative, in India (if any).**

Name & Address: \_\_\_\_\_

City: \_\_\_\_\_ Province: \_\_\_\_\_

Pin code: \_\_\_\_\_ Tele: \_\_\_\_\_ Fax: \_\_\_\_\_

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5. **Financial Details.**

- (a) Annual Turnover: \_\_\_\_\_ USD
- (b) Number of Employees in firm \_\_\_\_\_.
- (c) Details of manufacturing infrastructure available \_\_\_\_\_.
- (d) Earlier contracts with Indian Ministry of Defence/ Government agencies:

<u>Agency</u>	<u>Contract Number</u>	<u>Equipment</u>	<u>Quantity</u>	<u>Cost</u>

6. **Certification Quality Assurance Organisation (If Applicable).**

<u>Name of Agency</u>	<u>Certification</u>	<u>Applicable from (date&amp; year)</u>	<u>Valid till (date &amp; year)</u>

7. **Equipment/Product Profile (to be submitted for each product separately):-**

- (a) Name of 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) Status (in service /design & development stage): \_\_\_\_\_
- (e) Production capacity per annum: \_\_\_\_\_
- (f) Countries where equipment is in service: \_\_\_\_\_
- (g) Whether export clearance is required from respective Government: \_\_\_\_
- (h) Any collaboration/joint venture/ co production/ authorized dealer with Indian Industry (give details):

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55

Name & Address: \_\_\_\_\_

Tel : \_\_\_\_\_ Fax: \_\_\_\_\_

(j) ROM price in the following format (not restricted):-

<b><u>Sr</u></b>	<b><u>Item</u></b>	<b><u>Unit Cost (Rs Crores)</u></b>	<b><u>Norms Followed for discovery of Price</u></b>
(i)	Helicopter		
(ii)	Spare Engine		
(iii)	Packing & Transportation		
(iv)	Training & Deputation		
(v)	Performance Based Logistics for 10 years		
(vi)	GSE / GHE		
(vii)	Additional Support Eqpt SAR Kits		
(viii)	Torpedo and associated system		
(ix)	Chaff and Flares		
(x)	Simulator		
(xi)	ToT/ MToT		
(xii)	MRO		
(xiii)	AMC for Simulators		
	Any other detail		
	<b><u>Total Cost of Project</u></b>		

8. Alternatives for meeting the objectives of the equipment set forth in the RFI.

9. Any other relevant information. \_\_\_\_\_

10. **Declaration.** It is certified that:-

(a) The above information is true and any changes will be intimated within five (05) working days of occurrence.

(b) The \_\_\_\_\_ (name of firm) has never been banned/de-barred for doing business with MoD/Gol/any other government organisation and that there is no inquiry going on by CBI/ED/ any other government agency against the firm.

**Note:-** Para 44 and Appendix F of Chapter II of DPP 16 may be referred

**(Authorised Signatory)**

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