TECHNOLOGY PERSPECTIVE AND CAPABILITY ROADMAP (TPCR) - 2018

Preamble

1. Technology Perspective and Capability Roadmap – 2018 (TPCR- 2018) provides to the industry an overview of equipment that is envisaged to be inducted into the Indian Armed Forces upto the late 2020s. This document intends to drive the technology development process that the industry may like to pursue. This roadmap may guide the industry in planning or initiating technology development, partnerships and production arrangements.

2. Whilst pursuing any development or collaboration, the Indian industry should accord due importance to the Indian Government's thrust towards 'Make in India'. The Ministry of Defence is committed to the Government's drive towards development of indigenous production capability in the private and public sectors. Participation of the MSMEs is also being encouraged in the 'Make in India' initiatives of our armed forces.

3. The first edition of the TPCR was published in Apr 2013. Numerous inputs have since been received from the industry and business organisations for making the document more informative for potential manufacturers. Accordingly, the format and content of this edition of the TPCR have been revised and details of quantity, life cycle, broad parameters and preferred technologies have been included to the extent possible.

Clarifications and Points of Contact (POC)

4. The Ministry of Defence (Acquisition Wing) or Service HQs may be consulted for any further clarifications or amplifications. Each Service has provided Points of Contact (POC) to facilitate ease of doing business as under:-

(a) Army. Director PP ADB (Industry)
Army Design Bureau; Tele No – 011-23019003
Email – ddgtechres-mod@gov.in

(b) Navy. POCs have been provided at every serial in TPCR concerning Naval projects owing to diversity of equipment and the spread of dealing directorates.

(c) Air Force. Director Plans (H)
D Plan (H); Tele No – 011- 23060203
AF Exchange (VB) – 011- 23010231 Ext 7425

Links to Services 'Make' Projects

5. The following links are provided to respective 'Make' projects of the Services hosted on MoD website, to maximise industry awareness and to realise the goals of 'Make in India' initiative of GoI: -

(a) Army. https://indianarmy.nic.in/makeinindia

(b) Navy. https://www.makeinindiadefence.com/

https://www.indiannavy.nic.in/content/indian-naval-indigenisation-plan-inip-2015-2030

(c) Air Force. www.makeindiadefence.Com/updated%20List%20&%20%20project%20manager%details%20-%2010.10.2017.pdf

Disclaimer

6. This document is not a commitment by the Indian Armed Forces or any organ of the Government of India for procurement of any specific type, make or quantity of equipment. The Government of India reserves the right to alter, delete or add to any part of this document without stating any reason. Participation of the industry in the "Technology Perspective and Capability Roadmap" of Indian Armed Forces is solely at its own discretion.

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Ser	**Programme / Project**	**Expected Life Cycle of Equipment (Yrs)**	**Approx Quantity**	**Amplifying Remarks (If Any)**
ARMOURED FIGHTING VEHICLES SYSTEMS				
Tanks				
1.	**Power Pack**	850-900 hrs	2000	Army
Broad Parameters / Preferred Technologies. Power rating: 1200 - 1500 HP, Integrated with automatic transmission, Power to wt ratio > 24.				
2.	**Active Protection System (APS)**	15-20	3500	Army
Broad Parameters / Preferred Technologies. 360°, against chemical energy based ammunition and ATGMs along with Passive counter measures.				
3.	**Armour Protection**.	15-20	3500	Army
Broad Parameters/ Preferred Technologies. Armour providing protection of RHAe > 1000mm.				
4.	**Night Vision Sights**	10-15	4000	Army
Broad Parameters/ Preferred Technologies. *(a) **Gunner Sight** - DRI ranges of 6/4/2kms, Capability of firing a Gun-launched ATGM. Minimum FPA 1024 x 1080.* *(b) **Commander Sight** - Panoramic Sight with DRI ranges 8/6/3km and capability to fire all on board weapon system. Minimum FPA 640 x 512.* *(c) **Driver Sight** - Un-cooled TI sight with DRI ranges 400m/ 250m /150m, Min FPA 640 x 512.*				
5.	**Auxiliary Power Unit**	2000 hrs	3500	Army
Broad Parameters/ Preferred Technologies. Minimum output 12 KVA, diesel operated, low thermal and audio signature.				

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6.	**Environmental Control Unit (ECU)**	2000hrs	Total 3500	Army
Broad Parameters/ Preferred Technologies. Capable of functioning in temperature ranges -5 to 45±5º, operate on 24 V and achieve an inside temperature of 28±5ºC.				
ICV				
7.	**Power pack**	850-900 hrs	2000	Army
Broad Parameters/ Preferred Technologies. Power rating > 360 HP, Integrated with automatic transmission, Power to wt ratio > 20				
8.	**Armour Protection**	10-15	2000	Army
Broad Parameters/ Preferred Technologies. All round STANAG level 4.				
9.	**Night Vision Sights**	10-15	2000	Army
Broad Parameters/ Preferred Technologies. *(a) **Gunner Sight**. 3rd Generation sight with DRI ranges up to 6/4/2 Km, Min FPA 640 x 512.* *(b) **Commander Sight**. Panoramic Sight with Commander capable of firing all on board weapon systems. Minimum FPA 640 x 512.* *(c) **Driver Sight**. Un-cooled TI sight with DRI ranges 400m/250m /150m, Min FPA 640 x 512.*				

Ser	Programme / Project	Expected Life Cycle of Equipment (Yrs)	Approx Quantity	Amplifying Remarks (If Any)
	SHIPS/ CRAFT			
Ships				
10.	**Aircraft Carrier**	40	01	Navy **POC- PDACP 011-23793171**
Broad Parameters/ Preferred Technologies. Details will be shared after Staff Requirements are finalised.				
11.	**Automatic Carrier Landing System (ACLS)**	15	05	Navy **POC- PDACP 011-23793171**
Broad Parameters/ Preferred Technologies. An aircraft recovery system for safe recovery of multi-role deck based fighter in Visual Meteorological Conditions (VMC) and Instrument Meteorological Conditions (IMC) as specified in ICAO Document.				
12.	**Fresnel Lens Based Optical Landing System**	15	05	Navy **POC- PDACP 011-23793171**
Broad Parameters/ Preferred Technologies. The OLS is a system of light arranged vertically and horizontally which provides the pilot with the desired glide slope to be maintained. The OLS light arrangement indicates the safe zone for approach and also the unsafe zone when the aircraft is either above or below the correct glide slope. The range of an OLS is typically 5000 meters.				
13.	**Next Generation Destroyers (NGD) / Next Generation Frigates**	20-25	05-10	Navy **POC-PDND**

Ser	**Programme / Project**	**Expected Life Cycle of Equipment (Yrs)**	**Approx Quantity**	**Amplifying Remarks (If Any)**
	(NGF)			**011-40678710**
Broad Parameters/ Preferred Technologies. Details will be shared after Staff Requirements are finalised.				
14.	**Next Generation OPV (NGOPV)**	20-25	06	Navy **POC-PDSP 011-26886427**
Broad Parameters/ Preferred Technologies. Details will be shared after Staff Requirements are finalised.				
15.	**Next Generation Corvettes (NGC)**	20-25	07	Navy **POC-PDND 011-40678710**
Broad Parameters/ Preferred Technologies. NGC would be capable of offensive SSM attack, ASW operations, Local Naval Defence and VBSS operations. Vessel would be fitted with IPMS, SSM system, MR Gun system, CIWS, Chaff, LIMO weapons and ASW weapons and sensors.				
16.	**Missile Boats/ Next Generation Missile Vessel (NGMV)**	20-25	06	Navy **POC-PDSP 011-26886427**
Broad Parameters/ Preferred Technologies. For supporting Missile Systems, Surveillance Radars, Ship would be fitted with SSM complex, SAM Complex, MR gun, CIWS, PDS, Chaff and LIMO weapons.				
17.	**Mine Counter Measures Vessel (MCMV)**	30	>10	Navy **POC-PDSP 011-26886427**
Broad Parameters/ Preferred Technologies. Approximate length of about 60 m, the MCMVs would adopt a				

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combined concept of mine hunting and mine sweeping in order to carry out Mine Counter Measure Operations to ensure sustained shipping to and from major ports and OTR requirement of naval vessels at major ports and harbours.				
18.	**Fleet Support Ship (FSS)**	30	>5	Navy **POC-PDSP 011-26886427**
Broad Parameters/ Preferred Technologies. Fleet Support Ship is 210m long vessel, envisaged to Replenish Fleet Ships at sea with a minimum of five Transfer Points and will be able to achieve pumping rates up to 2400 TPH. The vessel will also be able to carry ammunition and victualling stores for the fleet. The ship would be equipped with weaponries like Anti-ship, Anti-submarine and CIWS system.				
19.	**RAS/FAS (Supply Ship)**	25	20-25	Navy **POC-PDNA 011-21410483**
Broad Parameters/ Preferred Technologies. *Replenishment at Sea (RAS)/ Fuelling at Sea (FAS) system for supply ship iaw DEFSTAN 07 of 279 Issue 3.*				
20.	**FAC/XFAC/FPV**	15-20	20	Navy **POC-PDSP 011-26886427**
Broad Parameters/ Preferred Technologies. Details will be shared after Staff Requirements are finalised				
21.	**Multi Purpose Vessel (MPV)**	25	5	Navy **POC-PDSP**

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				011-26886427
Broad Parameters/ Preferred Technologies. MPVs would be capable of towing ships, launching targets and being used as a trial platform for weapons & sensors. Capable of handling ALH/ NUH Helo Operations.				
22.	**Diving Support Craft**	20	5	Navy **POC-PDSOD** **011-23011679**
Broad Parameters/ Preferred Technologies. The primary function is to conduct operational/ training dives in harbours and coastal waters. The secondary function is conveyance of divers and equipment to diving area. The length of the craft should not be more than 30 m.				
Barges				
23.	**1000 Ton Fuel Barge**	20	3	Navy **POC-PDSP** **011-26886427**
Broad Parameters/ Preferred Technologies. The oil Barge should be capable of replenishing LSHSD, AVCAT and other oils for ships in harbor, at anchorage and fuel depots at distant location. Should be able to operate up to Sea state 4 and survive up to sea state 6. The Beam extreme of the barge should not be more than 15m. The Draught should not be more than 4m.				
24.	**500 Ton POL Barge**	20	5	Navy **POC-PDSP** **011-26886427**

Ser	Programme / Project	Expected Life Cycle of Equipment (Yrs)	Approx Quantity	Amplifying Remarks (If Any)
Broad Parameters/ Preferred Technologies. The oil barge should be capable of replenishing LSHSD, AVCAT and other oils for ships in harbour, at anchorage and fuel depots at distant locations. The barge should be able to operate up to sea state 4 and survive up to sea state 6. The Beam of the barge should not be more than 15m. The draught of the barge should not be more than 4m. The displacement of the Barge should not exceed 1000 tons.				
25.	**300T Sullage Barges**	20	5	Navy **POC-PDSP 011-26886427**
Broad Parameters/ Preferred Technologies. The sullage may consist of contaminated POLs or bilge residues. The Sullage Barge should be capable of receiving Sullage from ships, submarines and discharge it at designated points. The Barge should be able to carry out its functional role up to Sea State 3 and per approved Class/ IMO norms. The Length of the Barge should not exceed 40m. The Draught should not be more than 3m. The Beam should be as per design.				
26.	**500 Ton Water Barge**	20	5	Navy **POC-PDSP 011-26886427**
Broad Parameters/ Preferred Technologies. The Water Barge should be capable of replenishing water for ships in harbour and at anchorage. The barge should be able to operate up to sea state 4 and survive up to sea state 6.				
27.	**200 Ton Water Barge**	20	5	Navy **POC-PDSP 011-26886427**
Broad Parameters/ Preferred Technologies. The function is to replenish water to ships and submarines in				

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harbor (alongside) and at anchorage. The Barge should be capable of operation upto Sea State 3. The Length of the Barge would be about 30m.The Beam of the Barge not be more than 12m and the displacement approximately 800T.				
28.	**Ammunition Cum Torpedo Cum Missile Barge (ACTCM)**	20	>10	Navy **POC-PDSP 011-26886427**
Broad Parameters/ Preferred Technologies. The function of the Barge is to transport ammunition & missiles to ships alongside. The Barge should have clear opening of 16.5M X 6M X 3.1M (Length X Breadth X Height).				
29.	**Missile Cum Ammunition (MCA) Barge**	20	10	Navy **POC-PDSP 011-26886427**
Broad Parameters/ Preferred Technologies. The function is to embark/ disembark missiles and ammunition to ships alongside. The Beam of the Barge should not be more than 10m. The Length is to be as required to carry the cargo and draught should be maximum 2 meters, when fully loaded.				
30.	**100 Men Accommodation Barges**	20	3	Navy **POC-PDSP 011-26886427**
Broad Parameters/ Preferred Technologies.				
Air Cushion Vehicles				
31.	**Air Cushion Vehicle (Troop Carrier)**	15-20	More than 15	Army

Ser	Programme / Project	Expected Life Cycle of Equipment (Yrs)	Approx Quantity	Amplifying Remarks (If Any)
Broad Parameters/ Preferred Technologies. Capable of negotiating sand bars and marshy lands as obtained in our riverine/ coastal areas. The equipment should have a payload of not less than 10 Tons. It should be able to clear obstacles of heights up to approximately 0.8m. The equipment should have a minimum operational range of 100 nautical miles and cruising speed of approximately 30 knots. The equipment should be equipped with suitable navigation, night vision and meteorological equipment. The equipment should be sea worthy in hovering mode in sea state 2.				
32.	**Air Cushion Vehicle (Reconnaissance & Patrolling)**	15-20	More than 40	Army
Broad Parameters/ Preferred Technologies. The equipment should have a payload of not less than 2 Tons. It should be able to clear obstacles of heights upto approximately 0.5 m. The equipment should have a minimum operational range of 100 nautical miles and cruising speed of approximately 30 knots. The equipment should be equipped with suitable navigation, night vision, surveillance and meteorological equipment. The equipment should be sea worthy in hovering mode in sea state 2.				
Miscellaneous Craft				
33.	**50 T BP Tugs**	20	10	Navy **POC-PDSP 011-26886427**
Broad Parameters/ Preferred Technologies.				
34.	**25 Ton BP Tugs**	20	10	Navy **POC-PDSP 011-26886427**
Broad Parameters/ Preferred Technologies. The function is to assist naval ships and submarines in berthing				

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and unberthing/ turning/ maneuvering in confined waters/ harbours. The tug should be able to carry out its functional role up to Sea State 4 and operate up to Sea State 6 and survivable as per approved Class/ IMO norms. The Length and Beam of the tug should be as per design. The Draught of the tug should not be more than 3m.				
35.	**250 Men Ferry Craft**	20	5	Navy **POC-PDSP 011-26886427**
Broad Parameters/ Preferred Technologies. For *transport of personnel to and from ships at anchorage, to deliver stores/ rations to ships and patrol within harbour limits.*				
36.	**Floatsam Recovery Boat**	20	10	Navy **POC-PDSP 011-26886427**
Broad Parameters/ Preferred Technologies.				

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FIXED WING AIRCRAFT SYSTEMS				
37.	**Geo Spatial Information System**	10 -15	2	Air Force
Broad Parameters/ Preferred Technologies. It should enable specialist users of IAF located at one place for producing products like Aeronautical enroute Charts, Electronic FLIPS, Terminal Charts, Electronic Terrain and Obstacle Data and inter conversion of Data formats. It should also enable Generic users to utilise using web browser based applications and enable to carry out evaluations of the data. The entire system should be database driven having application server software and file server software.				

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REMOTELY PILOTED AIRCRAFT AND SYSTEMS				
RPAs				
38.	**Medium Altitude Long Endurance (MALE) RPA**	15 - 20	100 - 150	Joint (Army, & Navy
Broad Parameters/ Preferred Technologies. The RPA and its payloads should be capable of undertaking the task of search and reconnaissance of area as well as moving target, Artillery Adjustment, Urban Security, Combat SAR, Coastal and Maritime Patrol, Disaster Control and Protection of Facilities. Altitude ceiling should be around 30000 feet or above. Endurance should be more than 24 hrs with SAR and EO/IR payloads. The maximum range should be more than 250 Km in LOS mode and max possible with SATCOM link. Detachable Payloads to include Maritime Radar, ESM, ELINT, ECCM, COMINT, EO/IR, SATCOM Link. *VTOL Shipborne for marine version*				
39.	**Remotely Piloted Aircraft (RPA) (HALE, VTOL, Ship-borne)**	15	HALE ï More than 20 VTOL ï 25 - 30 Ship Borne ï More than 50 Systems (Each system having 03 RPAs)	Navy **POC-PDNAS 011-23011711**
Broad Parameters/ Preferred Technologies. Detachable Payloads to include Maritime Radar, ESM, COMINT, EO/IR, SATCOM Link				
40.	**Submarine Launched RPA**	25	10	Navy
Broad Parameters/ Preferred Technologies.				

Ser	Programme / Project	Expected Life Cycle of Equipment (Yrs)	Approx Quantity	Amplifying Remarks (If Any)
41.	**Short Range RPA**	20	50	Army
Broad Parameters/ Preferred Technologies. *(a) Range 200 Km (LOS)* *(b) Endurance 10 hrs* *(c) Altitude Ceiling Upto 20,000 feet* *(d) Payload EO (Day/Ni), SAR, ESM, ELINT* (e) *Multiple Payload carriage Capability.*				
42.	**Hybrid RPAs**	20	30	Army
Broad Parameters/ Preferred Technologies. Short Range RPAs with ranges up to 200 Kms and 20000 ft alt, with capability of rotary wing and fixed wing RPAs facilitating faster transition to and from the target in fixed wg configuration and hover capability in the target area. The ability will also enable to launch and recover the RPA by multiple modes.				
43.	**Stealth RPAs**	20	55-70	Army
Broad Parameters/ Preferred Technologies. MALE/HALE RPAs (range up to 1,500 Kms and alt 50,000 to 60,000 ft) with stealth capability to avoid detection by enemy radars. Capability to incorporate special payloads including communication interception equipment, jamming weapons and NBC detection.				
44.	**Combat RPA**	20 yrs	More than 30	Joint (Army & Navy)
Broad Parameters/ Preferred Technologies. MALE class of RPA with capability to fly upto 30,000 ft alt with extended ranges (SATCOM) and endurance more than 24h. Capability of engagement of static and mobile ground targets and Maritime Targets (Surface and Underwater) with a min stand-off dist of 20 km				
45.	**Special Optical Payload**	20	More than 20	Army
Broad Parameters/ Preferred Technologies. Multiple Optical Camera in a single payload with capability of				

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handling each camera independently and covering a large swath of approximately 100 km.				

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	SUBMARINES SYSTEMS			
46.	**Off Board Vehicles**	15	12	Navy **POC-PDSR 011-23011680**
Broad Parameters/ Preferred Technologies. Sub-systems to be developed:-Ejection System, UW Communication ,Electronic Control, Payload for vehicle				
47.	**AUVs/ ROVs for Mine Neutralisation**	15	10	Navy **POC-PDSR 011-23011680**
*Broad Parameters/ Preferred Technologies. Multi Mission High Endurance AUV is planned to be inducted. The AUV is envisaged to be capable of undertaking MCM operations including mine neutralization. The HE AUV should be capable of carrying out other missions like ISR, carry different payloads and act as Communication link for **submarines**.*				
48.	**Submarine Diesel Generators**	25	20	Navy **POC-PDSMAQ 011-23011067**
Broad Parameters/ Preferred Technologies. The Diesel Generators should be capable of facilitating generation of 1.5 MW. The engines should be marinised and capable of operating under a minimum back pressure of 0.8 Bar				
49.	**Submarine Main Propulsion Motors**	25	More than 5	Navy **POC-PDSMAQ**

Ser	**Programme / Project**	**Expected Life Cycle of Equipment (Yrs)**	**Approx Quantity**	**Amplifying Remarks (If Any)**
				011-23011067
Broad Parameters/ Preferred Technologies. ***Permasyn*** *Motor*				
50.	**Integrated Combat Suites for Submarines**	25	10	Navy **POC-PDSMAQ 011-23011067**
Broad Parameters/ Preferred Technologies. Combat System should be integrated with inputs from all sensors & Data Link equipment and configured to fire torpedoes and missiles nominated by the Indian Navy.				
51.	**Submarine System Controls**	25	More than 5	Navy **POC-PDSMAQ 011-23011067**
Broad Parameters/ Preferred Technologies. Includes Integrated Platform Management System (IPMS), Automatic Power management System (APMS), Diesel Engine Monitoring System (DMS), Ships Motion Control System (SMCS), Battery Monitoring System (BMS), Insulation Monitoring System for ships network, Fire Detection System, Automatic Fire Suppression System, Refrigeration/Air Conditioning System and Ventilation Control System etc. Capable of monitoring and operating all the equipment and systems onboard the submarine using modular real time operating systems which have hardened data bus architecture. Design of highly reliable and performance consistent actuators would also form a part of these technologies.				
52.	**Power Aggregates for Submarines**	25	10	Navy **POC-PDSMAQ 011-23011067**
Broad Parameters/ Preferred Technologies. To include switchboards, switchgear, conversion machinery, power shapers, transformers, invertors, etc. The power technology should be based on IGBT, digital control				

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with state of art feedback and monitoring to ensure smooth outputs in addition to high quality and reliability.				
53.	**Towed Wire Antenna System**	15	More than 5	Navy **POC-PDSMAQ 011-23011067**
*Broad Parameters/ Preferred Technologies**.*				
54.	**Lithium Ion Batteries for Submarines**	25	More than 10 sets	Navy **POC-PDSMAQ 011-23011067**
Broad Parameters/ Preferred Technologies. High capacity batteries which cater for longer duration of dived condition for conventional submarines.				

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	WEAPONS AND SYSTEMS			
Land Systems				
55.	**Inertial Navigation System - Global Positioning System**	30	300	Army
Broad Parameters/ Preferred Technologies. Vehicle mounted gun system. Emerging technologies such as vision sensors for Simultaneous Localisation and Mapping (SLAM), Micro-Electro-Mechanical Systems (MEMS), etc be incorporated for weight optimization, enhanced accuracy and autonomous operations. Future expansion for interfacing the system with external navigation aids should exist.				
56.	**81mm Mortar**	15 Yrs	2000 - 2500	Army
Broad Parameters/ Preferred Technologies. Extended Range and Airburst Capability Capable of achieving range of 7 – 10 Km (with extended range ammunition). Total weight of 30- 35 Kg to include Tube, Bipod and Base Plate. Automatic fire Control enabled and Rapid fire Capability (more than 20 Bombs/ min).				
57.	**Anti RPA Defence System (RF inhibition)**	10 Yrs	More than 70	Joint (Army & Air Force)
Broad Parameters/ Preferred Technologies. AUDS should be designed to disrupt and neutralize RPAs engaged in hostile airborne surveillance or any other activities. It should have combination of electronic-scanning radar target detection, electro-optical (EO) tracking/ classification and directional RF inhibition capability. Sys should be able to remotely detect all RPAs from micro to MALE. It should be operated in mil as well other RF Bands. Detection range $\geq$ 40 Kms, EOTS range $\geq$ 12 Kms and RF inhibition range $\geq$ 7 Kms.				
58.	**Tactical High Energy Laser System**	12	Ph 1 Less than 5 Ph 2 More than 15	Army & Air Force

Ser	Programme / Project	Expected Life Cycle of Equipment (Yrs)	Approx Quantity	Amplifying Remarks (If Any)
Broad Parameters/ Preferred Technologies. ***Phase I*** *(a) A HMV based LASER weapon system to cause physical damage/destruction to EW systems, communication systems and non communication systems/radars and their antennas.* *(b) Should be also effective against microwave towers, cellular towers, and cables.* *(c) Weapon system should be capable of an effective range of 6-8km.* *(d)* Should be capable against small aerial targets/objects. **Phase II** *(a) Should be effective against Soft skinned vehicles and troops.* *(b) Range should be upto 20 KM and beyond.* *Should be capable of anti satellite role from ground & aerial platform.* *Should be as effective in ground-to-ground role as for ground-to-air role.* Should have gyrostabilised aiming and target locking capability.				
59.	**High Power Electromagnetic Weapon System**	10	Ph 1 Less than 5 Ph 2 More than 15	Army & Air Force
Broad Parameters/ Preferred Technologies. ***Phase-I***. *(a) An HMV based High Energy Electromagnetic Weapon System, to be employed against enemy's electronic & electrical system in TBA at a range of 6-8 KM and more.* *(b) Should be effective against all cellular towers, microwave towers, communication networks and command & control setup.* *(c) Should be effective against avionics & radars of aircrafts & RPAs.* ***Phase-II***.				

Ser	Programme / Project	Expected Life Cycle of Equipment (Yrs)	Approx Quantity	Amplifying Remarks (If Any)
(a) Should be effective against vehicle ignition system, IEDs, mines and guidance system of missiles, PGMs and SSMs. *(b) Range should be more than 15 km.*				
60.	**Para Droppable Gun Tower**	20	20	Army
Broad Parameters/ Preferred Technologies. The gun tower is being envisaged to be employed with Ultra Light Howitzer gun system which will be provided to Para Field Regt for specialized ops. The gun tower is expected to be 6X6 drive with payload capacity of approx 4.5 Tons with the capability to be carried under slung with MI 26/ Chinook helicopter. The vehicle should be equipped with self-recovery winch capable of fore/aft vehicle recovery ops. The gun tower to have automatic transmission and the capability of being dropped using Low Altitude Parachute Extraction System (LAPES).				
61.	**Heavy Counter Improvised Explosive Device (IED) Robotic System**	10	100	Army
Broad Parameters/ Preferred Technologies. Capable of carrying out explosive ordnance disposal in buildings, installations, bus/ metro/ railway stations. Should have video camera, X-ray with real time viewing system and a disruptor. Equipment should have a telescopic boom with weight lifting capability of approximately 120 kg. Equipment should have capability of being radio controlled from a distance of approximately 400m in urban/ built up areas. Equipment should enable hand held wired control upto 200m. Weight of the equipment should not exceed 350 kg.				
62.	**Manpack Counter Improvised Explosive Device (IED) Robotic System**	10	600	Army
Broad Parameters/ Preferred Technologies. Carry out surveillance and explosive ordnance disposal inside vehicles, trains, air craft and larger open areas. Equipment should have video cameras and disruptor. Weight lifting capability of the equipment should be approximately 2 kg. Equipment should have capability of being				

Ser	Programme / Project	Expected Life Cycle of Equipment (Yrs)	Approx Quantity	Amplifying Remarks (If Any)
radio controlled in urban/ built up areas at a distance not less than 100m. Equipment should enable hand held wired control upto 200m. Weight of the equipment should not exceed 15 kg.				
Marine Systems				
63.	**Torpedo (Range>25 Km and Speed >50 Knots)**	25	More than 150	Navy **POC-PDSR 011-23011680**
Broad Parameters/ Preferred Technologies. The torpedo should be of 533mm, capable of being exploited from existing LWT Launchers in IN. The range of the torpedo should be in excess of 25Kn and speed in excess of 50Kn. It should be able to operate upto depths of 450m. The torpedo should have advance Logic to counter modern submarine fired decoy. The torpedo HH should be able to detect modern conventional submarines at ranges in excess of 2500m. The torpedo should be universal for employment by air and surface units.				
64.	**Extended Range ASW Rocket**	25	More than 2000	Navy **POC-PDSR 011-23011680**
Broad Parameters/ Preferred Technologies. The ER ASR is envisaged to have ranges in excess of 8100 m while retaining the dimensions of the extant AS Rocket (RGB60). The rocket should be capable of exploiting the present pistol YDB60 for detonation. Electronic fuze also suitable for YDB60.				
65.	**Targeting Pods**	15	More than 100	Joint (Navy & Air Force)

Ser	Programme / Project	Expected Life Cycle of Equipment (Yrs)	Approx Quantity	Amplifying Remarks (If Any)
Broad Parameters/ Preferred Technologies. Targeting pods for fighters and payloads for RPAs. These pods should consist of the day and night sensors including Laser designator for detection and tracking and surface targets and to provide targeting data for laser/ EO guided bombs. The system is to be based on state of art IR and CCD sensors with good detection ranges and would need to be integrated on the IN fighter and RPAs. The pods should have laser Spot Seeker with search and tracking facility, Laser Marking (LM) facility and Night navigation capability by display of FLIR imagery on HUD for fighters.				
66.	**Close in Weapon System to replace AK 630**	25	30	Navy **POC-PDSR 011-23011680**
Broad Parameters/ Preferred Technologies. The system should be a missile cum gun complex with its integral fire control system. The range of missile and gun should not be less than 6 km and 4 km respectively. The gun should be of 20-30mm caliber with a rate of fire of not less than 4000. The missile and gun ammunition should be capable against fighters, missiles and surface crafts. It should have radar cum optical guidance facility.				
67.	**Rail – less Helo Traversing System**	25	40-45	Navy **POC-PDNA 011-21410483**
Broad Parameters/ Preferred Technologies. *Capable of traversing helicopter from landing grid on helo-deck to hangar, on board ships. Specifications will depend on type of helicopter to be carried and will be finalised subsequently.*				
68.	**Foldable Helo Hangar Doors**	25	40-45	Navy **POC-PDNA 011-21410483**

Ser	Programme / Project	Expected Life Cycle of Equipment (Yrs)	Approx Quantity	Amplifying Remarks (If Any)
Broad Parameters/ Preferred Technologies. *Specifications will be decided at the time of finalising ship design.*				
69.	**Electro – hydraulic Davit**	15	80-85	Navy **POC-PDNA** **011-21410483**
Broad Parameters/ Preferred Technologies. *3-5 T capacity. For hoisting 7-10 m Rigid Hull Inflatable Boats (RHIBs).*				
70.	**Sewage Treatment Plants (STP) with VTS (Vacuum Toilet System)**	15	130-140	Navy **POC-PDNA** **011-21410483**
Broad Parameters/ Preferred Technologies. *Capacities and numbers will depend on the class of ship and will be decided at the time of finalising ship design.*				
71.	**Capstans (Anchoring & Mooring)**	25	80-85	Navy **POC-PDNA** **011-21410483**
Broad Parameters/ Preferred Technologies. *Numbers, sizes and specifications will be decided at the time of finalising ship design.*				
72.	**Impressed Current Cathodic Protection (ICCP) System**	15	55 - 60	Navy **POC-PDNA**

Ser	**Programme / Project**	**Expected Life Cycle of Equipment (Yrs)**	**Approx Quantity**	**Amplifying Remarks (If Any)**
				011-21410483
Broad Parameters/ Preferred Technologies. *Impressed Current Cathodic Protection System with Active Shaft Grounding. Specifications for each class of ship will be decided at the time of ship design.*				
73.	**Automatic Power Management System (APMS)**	12.5	60	Navy **POC- PDEE** **011-23011668**
Broad Parameters/ Preferred Technologies. *System compliant to IHQ/DEE specifications EED-50-48, which may be obtained from IHQ MoD (N) on as required basis.*				
74.	**Switchboards**	12.5	>110	Navy **POC- PDEE** **011-23011668**
Broad Parameters/ Technologies. *System compliant to IHQ/DEE specifications EED-Q-264, which may be obtained from IHQ MoD (N) on as required basis.*				
75.	**Heavy Motors (>15KW)**	12.5	> 3000	Navy **POC- PDEE** **011-23011668**
Broad Parameters/ Preferred Technologies. *System compliant to IHQ/DEE specifications EED-Q-071(R4), which may be obtained from IHQ MoD (N) on as*				

Ser	**Programme / Project**	**Expected Life Cycle of Equipment (Yrs)**	**Approx Quantity**	**Amplifying Remarks (If Any)**
required basis				
76.	**Light Motors (>15KW)**	12.5	> 10000	Navy **POC- PDEE 011-23011668**
Broad Parameters/ Preferred Technologies. *System compliant to IHQ/DEE specifications EED-Q-071(R4), which may be obtained from IHQ MoD (N) on as required basis*				
77.	**Conversion machinery (Rotary convertors)**	12.5	> 120	Navy **POC- PDEE 011-23011668**
Broad Parameters/ Preferred Technologies. *System compliant to IHQ/DEE specifications EED-Q-267, which may be obtained from IHQ MoD (N) on as required basis.*				
78.	**Navigational lights & Control Panel (NLCP)**	12.5	> 50	Navy **POC- PDEE 011-23011668**
Broad Parameters/ Preferred Technologies. *System compliant to IHQ/DEE specifications EED-Q-262, which may be obtained from IHQ MoD (N) on as required basis.*				
79.	**Helo Starting rectifier**	12.5	> 50	Navy **POC- PDEE**

Ser	**Programme / Project**	**Expected Life Cycle of Equipment (Yrs)**	**Approx Quantity**	**Amplifying Remarks (If Any)**
				011-23011668
Broad Parameters/ Preferred Technologies. *Equipment compliant to IHQ/DEE specifications EED-Q-267 (R4) (Feb 15), which may be obtained from IHQ MoD (N) on as required basis.*				
80.	**Automatic Change over switches (ACOS)**	12.5	> 600	Navy **POC- PDEE** **011-23011668**
Broad Parameters/ Preferred Technologies. *System compliant to IHQ/DEE specifications EED-Q-264, which may be obtained from IHQ MoD (N) on as required basis*				
81.	**Auto Transfer Switch (ATS)**	12.5	> 250	Navy **POC- PDEE** **011-23011668**
Broad Parameters/ Preferred Technologies. *System compliant to IHQ/DEE specifications EED-Q-264, which may be obtained from IHQ MoD (N) on as required basis*				
82.	**Ruggedised UPS**	12.5	> 750	Navy **POC- PDEE** **011-23011668**
Broad Parameters/ Preferred Technologies.				

Ser	Programme / Project	Expected Life Cycle of Equipment (Yrs)	Approx Quantity	Amplifying Remarks (If Any)
83.	**Auto Emergency Lantern (AELs)**	12.5	> 20000	Navy **POC- PDEE 011-23011668**
Broad Parameters/ Preferred Technologies. *Equipment compliant to IHQ/DEE specifications EED-Q-265, which may be obtained from IHQ MoD (N) on as required basis.*				
84.	**Multi Cable Transit (MCT) Glands**	12.5	> 30000	Navy **POC- PDEE 011-23011668**
Broad Parameters/ Preferred Technologies. *Specifications/ Parameters approved by Class/ Type approved, viz ABS, DNB, IRS, etc.*				
85.	**Sound Power Telephone (SPT)**	12.5	> 50 sets	Navy **POC- PDEE 011-23011668**
Broad Parameters/ Preferred Technologies. *Equipment compliant to IHQ/DEE specifications EED-50-08(R2), which may be obtained from IHQ MoD (N) on as required basis*				
86.	**Automatic Weather Observation System (AWOS)**	08 Yrs extendable upto 10 years with upgrades	> 50	Navy **POC-PDNOM 011-21410476**

Ser	Programme / Project	Expected Life Cycle of Equipment (Yrs)	Approx Quantity	Amplifying Remarks (If Any)
Broad Parameters/ Preferred Technologies. *AWOS onboard ships are required for recording of weather information for planning & conduct of marine and aviation operations and also to collect data for climatology. The information to be recorded includes wind speed & direction, air temperature, Relative Humidity, cloud height, visibility and atmospheric pressure. These products available onboard are disseminated to end users including Met office, Maritime Operation Centre (MOC), Search and Rescue (SAR) teams, Air-Traffic Control (ATC), flights/ air squadrons. The data logger of the system should have a facility to get connected to the onboard SATCOM terminal for real-time transmission of the recorded data to shore stations. 21" display repeaters will be required for locating them at vital locations onboard ships.*				
87.	**PC Based XCTD system**	08-10 yrs	> 40	Navy **POC-PDNOM** **011-21410476**
Broad Parameters/ Preferred Technologies. *The PC based **Expendable Conductivity Temperature Depth (XCTD)** system with ship borne receiving station and hand held XCTD probe launcher should be capable of recording of vertical profile of temperature, conductivity, depth, density and salinity up to a minimum depth of 1000 meters. Electromagnetic induction technology will be used for measurement of the conductivity. **XCTD Probes** should have shelf life of minimum 01 year when stored at temperature below 35^0C and humidity up to 99%.*				
88.	**Gas Turbines (for Conventional Propulsion)**	As per OEM specification	45 - 50	Navy **POC- PDME** **011-23011713**
Broad Parameters/ Preferred Technologies *Mil-graded Marine Gas Turbines upto 40 MW capacity qualifying to IN specified shock standards. SBN requirements to comply with MIL-STD-740-2. ABN requirements iaw MIL-STD-1474D and suitable MIL*				

Ser	Programme / Project	Expected Life Cycle of Equipment (Yrs)	Approx Quantity	Amplifying Remarks (If Any)
standard compliant acoustic enclosures and Infra-Red Suppression Device to be provided. Complete set of skid mounted auxiliaries (intakes, exhausts, starter, fuel pump, lub oil storage and conditioning arrangement etc) to support the Gas Turbines. Integral Digital Fuel Control System compatible with IPMS. Control, monitoring and interfacing through IPMS Integrated Test facility for full load trials.				
89.	**Main Diesel Engine (for conventional propulsion)**	As per OEM specification	> 100	Navy **POC- PDME 011-23011713**
Broad Parameters/ Preferred Technologies *Mil-graded Marine Diesel Engines of suitable capacity (derived from powering calculations) meeting IN specified shock standards. Meeting NES 313 or Class requirements based on platform specification. SBN requirements to comply with MIL-STD-740-2. ABN requirements iaw MIL-STD-1474D and suitable MIL standard compliant acoustic enclosures and Infra-Red Suppression Device to be provided. Control, monitoring and interfacing through IPMS. Class specification on mechanical vibration compliant to ISO 10816. Use of sea water based heat exchangers complying to NES 329.*				
90.	**Gas Turbine/ Diesel Generator Set**	As per OEM specification	> 200	Navy **POC- PDME 011-23011713**
Broad Parameters/ Preferred Technologies *Mil-graded/Class complying Generators powered by Marine Gas Turbines upto 40 MW capacity and/or Diesel Engines upto 12 MW capacity meeting NES 313 qualifying to IN specified shock standards. SBN requirements to comply with MIL-STD-740-2. ABN requirements iaw MIL-STD-1474D and suitable MIL standard compliant acoustic enclosures to be provided. Complete set of skid mounted auxiliaries (intakes, exhausts, starter, fuel pump, lub oil storage and conditioning arrangement etc) to support the Gas Turbines. Control, monitoring and interfacing through IPMS. Alternator to conform to EED-Q-242(R2). Integrated Test*				

Ser	Programme / Project	Expected Life Cycle of Equipment (Yrs)	Approx Quantity	Amplifying Remarks (If Any)
facility for full load thermal trials, Transient and M-Load Trials.				
91.	**Gear Box**	Shipôs Life	100	Navy **POC- PDME 011-23011713**
Broad Parameters/ Preferred Technologies *Main Propulsion Plant Gearboxes of suitable capacity approximately in the power output range of 1MW to 44 MW (derived from powering calculations) compliant to NES 305/Class Rules. Configuration of CODAD, CODAG, CODOG, CODLOG, CODLAG etc. Mounted assemblies include gearbox driven lub oil pumps, centrifuges for oil vapor separation, shaft locking and turning gear. Compliance with Structure Borne Noise (SBN) complying to MIL-STD-740-2, Air Borne Noise (ABN) levels complying to MIL-STD-1474D, mechanical vibrations complying to ISO 10816. Meeting IN specified shock standards. Compatible with IPMS through serial/ ethernet link. PTO units may be mounted for some applications.*				
92.	**Controllable Pitch Propeller (CPP) & Shafting**	Shipôs Life	> 100	Navy **POC- PDME 011-23011713**
Broad Parameters/ Preferred Technologies *The main components of shafting system would include (but not limited to) thrust block, plummer block, bulkhead gland, shaft locking gear & turning gear, loose coupling, stern gland, stern tube bushes, 'A' bracket and/ or 'P' Bracket, eddy plate, rope guard, torsionmeter, thrust shaft, intermediate shaft & tail shaft and propeller. Compliance with IN specified shock standards, Structure Borne Noise (SBN) complying to MIL-STD-740-2, Air Borne Noise (ABN) levels complying to MIL-STD-1474D, mechanical vibrations complying to ISO 10816. Extremely high reliability in performance throughout life cycle as shafting design is core to the ship. Low life cycle cost & durable life cycle support. High indigenous content (in design, manufacturing and propulsion system integration).*				

Ser	**Programme / Project**	**Expected Life Cycle of Equipment (Yrs)**	**Approx Quantity**	**Amplifying Remarks (If Any)**
93.	**Integrated Platform Management System (IPMS)**	8-10 years	More than 50	Navy **POC- PDME 011-23011713**
Broad Parameters/ Preferred Technologies *Engineering equipment and systems automation system. The IPMS should be based on VME 64 open architecture with distributed control system and dual redundant optical fibre network. Proprietary PLCs not to be used. Standardisation. Capable for integration with Integrated Bridge System (IBS), Addressable Fire Detection System (AFDS), Combat Management System (CMS), Battle Damage Control System (BDCS) through Gateways. Meeting IN specified shock standards.*				
94.	**AC Plant**	14-18 years	> 220	Navy **POC- PDME 011-23011713**
Broad Parameters/ Preferred Technologies *Central indirect AC plants utilising contemporary technology (magnetic bearing/screw compressors), catering to external environment of tropical conditions iaw Def Stan 02-102 (Part 1), Issue 3. Compressor capacity of approximately 100TR to 1000TR (would be based on platform requirements). The AC compressor should use R134A or a superior refrigerant. Compliance with Structure Borne Noise (SBN) complying to MIL-STD-740-2, Air Borne Noise (ABN) levels complying to MIL-STD-1474D and mechanical vibrations complying to ISO 10816 based on platform specification. Meeting IN specified shock standards.*				
95.	**Steering Gear**	14-18 years	> 50	Navy **POC- PDME 011-23011713**
Broad Parameters/ Preferred Technologies				

Ser	**Programme / Project**	**Expected Life Cycle of Equipment (Yrs)**	**Approx Quantity**	**Amplifying Remarks (If Any)**
Equipment matching contemporary global technology and compliance with IN specified shock standards, Structure Borne Noise (SBN) & Air Borne Noise (ABN) levels, mechanical vibrations. High efficiency and high power density. High reliability in performance through life cycle, increased MTBF, low MTTR (minimal downtime). Improved design to enable/ facilitate major repairs and maintenance in afloat conditions. Low life cycle cost and durable life cycle support. State-of-art VME 64 based control systems with advanced instrumentation. Standardisation. Indigenous system.				
96.	**Stabiliser**	14-18 years	45 - 50	Navy **POC- PDME 011-23011713**
Broad Parameters/ Preferred Technologies *Equipment matching global technology and compliance with IN specified shock standards, Structure Borne Noise (SBN) & Air Borne Noise (ABN) levels, mechanical vibrations. High efficiency and high power density. High reliability in performance through life cycle, increased MTBF, low MTTR (minimal downtime). Improved design to enable/ facilitate major repairs and maintenance in afloat conditions. Low life cycle cost and durable life cycle support. State-of-art VME 64 based control systems with advanced instrumentation. Standardisation*				
97.	**High Pressure Air Compressors (HPAC)**	14-18 years	> 150	Navy **POC- PDME 011-23011713**
Broad Parameters/ Preferred Technologies *Electric driven air compressors compliant to NES 315 of 30 bar to 280 bar output pressure and upto 12-14 LPM FAD. discharge capacity (would be based on platform requirements). Driers, filters and dehumidifiers are to be provided on the compressed air pipelines to eliminate moisture from air. The compressors will supply compressed air to the compressed air system at a final air temperature lesser than 43 deg C. compliance with IN specified shock standards, Structure Borne Noise (SBN) & Air Borne Noise (ABN) levels, mechanical vibrations. High efficiency and high power density. High reliability in performance through life cycle, increased*				

Ser	**Programme / Project**	**Expected Life Cycle of Equipment (Yrs)**	**Approx Quantity**	**Amplifying Remarks (If Any)**
MTBF, low MTTR (minimal downtime). Improved design to enable/ facilitate major repairs and maintenance in afloat conditions. Low life cycle cost and durable life cycle support. Standardisation.				
98.	**RO Plant**	14-18 years	> 200	Navy **POC- PDME 011-23011713**
Broad Parameters/ Preferred Technologies *Equipment matching contemporary global technology, compliant with MIL standards & environmental norms. Capacity from 2 TPD to 200 TPD with modular design of purification modules to facilitate scaling (would be based on platform requirements). Compliance with IN specified shock standards, Structure Borne Noise (SBN) & Air Borne Noise (ABN) levels, mechanical vibrations based on platform specifications. High efficiency and high power density. Low life cycle cost and durable life cycle support. High reliability, increased MTBF, low MTTR (minimal downtime). Preferably indigenous system or alternately high indigenous content with localized production. Standardisation.*				
99.	**High Pressure (HP) Water Mist/ CO_2 System**	14-18 years	> 50	Navy **POC- PDME 011-23011713**
Broad Parameters/ Preferred Technologies *Use of environmentally benign system compliant with MIL standards and has high efficiency. Extinguishing time preferably 120 seconds. Provisions for operation under blackout conditions. Highly reliable life cycle performance with low life cycle cost.Durable life cycle support. Modularity with standard as well as well-defined interfaces. Preferably indigenous system or alternately high indigenous content with localized production.*				
100.	**Canned Motor Pump**	14-18 years	> 1000	Navy **POC- PDME**

Ser	Programme / Project	Expected Life Cycle of Equipment (Yrs)	Approx Quantity	Amplifying Remarks (If Any)
				011-23011713
Broad Parameters/ Preferred Technologies *Compliant with MIL standards, high efficiency and high power density. Highly reliable and defect free performance through life cycle (specified period) with maximized MTBF and minimal MTTR (downtime). Compliance with IN specified shock standards, Structure Borne Noise (SBN) & Air Borne Noise (ABN) levels, mechanical vibrations. Low life cycle cost and durable life cycle support. Indigenous design, development & manufacture.*				
101.	**Advanced Induction Motors, Propulsion Converters, High Voltage (HV) Switchboards and Variable Frequency Drives**	Shipôs Life/As per OEM specification	25	Navy **POC- PDME** **011-23011713**
Broad Parameters/ Preferred Technologies *Part of Integrated Full Electric Propulsion/ Hybrid Electric Propulsion Plant. Capacity from 4MW to 20MW (would be based on platform requirements). Meeting IN specified shock requirements. Compliance with Structure Borne Noise (SBN) complying to MIL-STD-740-2, Air Borne Noise (ABN) levels complying to MIL-STD-1474D and mechanical vibrations complying to ISO 10816 based on platform specification.*				
102.	**Centrifuges**	14-18 years	> 210	Navy **POC- PDME** **011-23011713**
Broad Parameters/ Preferred Technologies *Automated self/manual cleaning type centrifugal purifiers of varying capacity from 1 tph to 10 tph. Meeting IN specified shock requirements. Compliance with Structure Borne Noise (SBN) complying to MIL-STD-740-2, Air Borne Noise (ABN) levels complying to MIL-STD-1474D and mechanical vibrations complying to ISO 10816 based on platform specification.*				

Ser	**Programme / Project**	**Expected Life Cycle of Equipment (Yrs)**	**Approx Quantity**	**Amplifying Remarks (If Any)**
103.	**Oxygen Generation Plant**	20 years	2 - 3	Navy **POC- PDME 011-23011713**
Broad Parameters/ Preferred Technologies *Supply Oxygen with 99.2 % purity at 220 bars with 5 to 8 micro meters fineness and a dew point of (-)63 deg C measured at 1 bar pressure. Capacity of minimum 30m^3/day at NTP with adequate storage arrangements. Meeting IN specified shock requirements. Compliance with Structure Borne Noise (SBN) complying to MIL-STD-740-2, Air Borne Noise (ABN) levels complying to MIL-STD-1474D and mechanical vibrations complying to ISO 10816 based on platform specification.*				
104.	**Nitrogen Generation Plant**	20 years	3-4	Navy **POC- PDME 011-23011713**
Broad Parameters/ Preferred Technologies *Supply Nitrogen with 99.2% purity at 350 bar pressure and dew point of (-) 63 deg C. Capacity of minimum 30m^3/day at NTP with adequate storage arrangements. Meeting IN specified shock requirements. Compliance with Structure Borne Noise (SBN) complying to MIL-STD-740-2, Air Borne Noise (ABN) levels complying to MIL-STD-1474D and mechanical vibrations complying to ISO 10816 based on platform specification.*				
105.	**Restraining Gear**	20 years	3-4	Navy **POC- PDME 011-23011713**
Broad Parameters/ Preferred Technologies *Mechanical, Structural and Hydraulic Modules with shock absorbers to assist in the take-off of Naval Carrier Borne Aircraft. Meeting IN specified shock requirements. Compliance with Structure Borne Noise (SBN)*				

Ser	Programme / Project	Expected Life Cycle of Equipment (Yrs)	Approx Quantity	Amplifying Remarks (If Any)
complying to MIL-STD-740-2, Air Borne Noise (ABN) levels complying to MIL-STD-1474D and mechanical vibrations complying to ISO 10816 based on platform specification.				
106.	**Arresting Gear**	20 years	3-4	Navy **POC- PDME 011-23011713**
Broad Parameters/ Preferred Technologies *Mechanical, Structural and Hydraulic Modules with wires to assist in the landing of Naval Carrier Borne Aircraft. Meeting IN specified shock requirements. Compliance with Structure Borne Noise (SBN) complying to MIL-STD-740-2, Air Borne Noise (ABN) levels complying to MIL-STD-1474D and mechanical vibrations complying to ISO 10816 based on platform specification*.				

Ser	Programme / Project	Expected Life Cycle of Equipment (Yrs)	Approx Quantity	Amplifying Remarks (If Any)
	MISSILES AND SYSTEMS			
107.	**Air to Air Missile System for Helicopter**	30	More than 500	Army
Broad Parameters/ Preferred Technologies. (a) *Air-to-Air Missile System for integration on identified helicopter platforms.* *(b) Missile should be fire-and-forget type, propelled by stable solid propellant.* *(c) Equipped with a robust advanced IR seeker to engage rapidly maneuvering aerial targets ie helicopters, fixed wing as well as unmanned aerial vehicles.* *(d) SSKP of 90% or more.* *(e) Maximum range of the missile should not be less than 7 km.* *(f) Firing of the missile should not affect helicopter adversely in terms of flying characteristics or damage to other components.* *(g) Fitment/ removal of launcher should be possible in short time in field conditions.* *(h) The shelf life of the missile should exceed 10 yrs.* *(j) Complete system should be capable of being stored/ maintained in field conditions and should be safe for transportation by road, rail or air.* *The system should have capability to engage multiple targets simultaneously by salvo firing and utilise multiple guidance technologies for increased immunity to counter measures.*				
108.	**SSMs (150 – 300 km range)**	15	200	Navy **POC-PDSR** **011-23011680**
Broad Parameters/ Preferred Technologies. The missile should be not more than 1 Ton in weight. It should have a range of more than 150 km with a sea-skimming profile and anti-ship role, land attack capability, terminal Maneuver and data link for target update.				

Ser	**Programme / Project**	**Expected Life Cycle of Equipment (Yrs)**	**Approx Quantity**	**Amplifying Remarks (If Any)**
109.	**Shore Based Missile for MMCBs**	25	100	Navy **POC-PDSR 011-23011680**
Broad Parameters/ Preferred Technologies. The missile should have a range of more than 250 km with a sea-skimming profile, anti-ship role and capable of being launched from land based mobile launchers. It should have its own mobile integral radar and support complex. It should be capable of being redeployed at short notice. Data link capability for target update and terminal manoeuvre.				
110.	**ATGM (ICV)**	15	2000	Army
Broad Parameters/ Preferred Technologies. 3rd Generation ATGM, range >4km, 1000mm twin launcher, LOBL and LOAL features				
111.	**ATGM (Tank)**	10-15	4250	Army
Broad Parameters/ Preferred Technologies. 3rd Generation ATGM, range >5km, Depth of Penetration > 650 mm				

Ser	Programme / Project	Expected Life Cycle of Equipment (Yrs)	Approx Quantity	Amplifying Remarks (If Any)
	AMMUNITION			
112.	**APFSDS**	10-15	4250 per year	Army
Broad Parameters/ Preferred Technologies. – Depth of Penetration > 650mm				
113.	**30 mm (Conventional)**	15	2000 per year	Army
Broad Parameters/ Preferred Technologies. Cannon- AP ammunition with DoP of 40mm RHA				
114.	**Breaching Ammunition**	05	3200	
Broad Parameters/ Preferred Technologies. Capability of being fired from an enclosed space/ room. Man portable, shoulder fired like Rocket Launcher. Tandem warhead capable of penetrating a reinforced concrete structure of 200mm and then blast effect. Range of 200-400 metres.				
115.	**Enhanced Range Artillery Projectile**	15	600,000	
Broad Parameters/ Preferred Technologies. Concept of Enhanced Range Artillery Projectile hinges on increasing the range of existing 155 mm ammunition system to 60-70 Km. It compliments existing HE, HE ERFB/BT and HE ERFB/BB ammunition system. Enhanced Range Artillery Projectile should be compatible with all calibers of 155mm i.e 39/45/52 and should have range up to 60 Kms with and MV of 925 m/s. The project designs combines rocket Mortar and BB Units in single project.				
116.	**70 mm Air to Ground Rockets**	10	HE Flechette Multi Dart Inert Practice All large numbers	Joint (Army & Air Force)
Broad Parameters/ Preferred Technologies. 70mm caliber fin stabilized Air-to-Ground unguided rockets				

Ser	Programme / Project	Expected Life Cycle of Equipment (Yrs)	Approx Quantity	Amplifying Remarks (If Any)
capable of being fired from existing rocket pods. Options for arming a common motor with warheads like High Explosive (HE), Armour Piercing (AP), Smoke, sub-munitions. Capable of being fired in direct and indirect mode over ranges varying from minimum 4 to 8 Kms. Suitable redundant safety mechanisms/ design features to obviate activation on mishandling/ ejection. Chemical composition should be stable/ inert enabling prolonged storage and uniform performance across varied temperature/ altitudes. 70 mm rockets should be capable of being fired successfully without any deterioration in parameters from fighters, trainers and helicopters. Types of warhead to be used are High Explosive (HE), Armour Piercing (AP, AP-T) & practice (Smoke & Flash). This should be transportable by Road, Rail, Air and Ship.				
117.	**20mm Gun Ammunition**	30	HE Flechette Multi Dart Inert Practice All large numbers	Joint (Army & Air Force)
Broad Parameters/ Preferred Technologies. (a) 20mm caliber belted gun ammunition capable of being fired from existing 20mm Gun fitted on helicopters in flight (moving or stationary) *(b) Capable of operation in the complete flight envelope of the platform in Indian conditions.* *(c) Ball, Tracer, Armour Piercing variants should be capable of being fired in mixed sequence without causing blinding flash, excessive smoke or fouling, damage to gun or helicopter. The cartridges should be housed in water proofed casing with non-corrosive and non-mercuric primer and be light weight to impose minimum weight penalty.* *(d) Capable of being stored/ maintained in field conditions without resorting to special storage conditions.* *(e) Safe transportation by road, rail or air with shelf life not less than 10 yrs.* *IAF is undertaking procurement of 20 mm Gun Ammunition for ALH WSI. Additional procurement of the same ammunition would be required on future procurements of LCH.*				
118.	**Standoff Guided Bombs**	15	650	Navy

Ser	Programme / Project	Expected Life Cycle of Equipment (Yrs)	Approx Quantity	Amplifying Remarks (If Any)
				POC-PDSR 011-23011680
Broad Parameters/ Preferred Technologies. High precision standoff guided Bombs to be employed for deck based fighters. The Bombs need to be designed with range extension kits ie. either propelled or winged to provide good standoff launch ranges. The bombs are required to be designed with laser or IR as terminal guidance and INS + satellite for mid-course guidance. They should be capable of day and night operations and targeting land and afloat targets (stationary and mobile).				
119.	**Insensitive Ammunition**	35	2000	Navy **POC-PDSR 011-23011680**
Broad Parameters/ Preferred Technologies. IM composition to comply with NATO Standard STANAG. Enhanced safety with equivalent end use performance, minimal severity and hazard effects on inadvertent initiation. Performance at par with conventional explosive filled warhead.				
120.	**Guided Ammunition for 76 mm and above**	25	4000	Navy **POC-PDSR 011-23011680**
Broad Parameters/ Preferred Technologies. The ammunition should have a range of not less than 50 km with seeker, control system and suitable fuse and warhead for capability against missiles, aircraft, ships, armour, ground targets and personnel.				
121.	**Design and Development of 125 kg bomb (akin to MK-81 Bomb)**	30	500/Year	IAF

Ser	Programme / Project	Expected Life Cycle of Equipment (Yrs)	Approx Quantity	Amplifying Remarks (If Any)
Broad Parameters/ Preferred Technologies. *(a) It should be adaptable on existing aircraft as well as futuristic aircraft. The bomb should have both Retarded Tail Unit (RTU) as well as Non-Retarded Tail Unit (NTU). The bomb should have facility for nose fusing as well as tail fusing of the store with any futuristic fuse.* *(b) The store should be compatible with Russian as well as Western suspension systems.* *(c) Shelf life of the bomb should be more than 30 years* *(d) The bomb should have Pre-fragmented and Thermo-baric variants of warhead.* *(e) Weight of the bomb should not exceed 125 kg.* *(f) Net Explosive Quantity should not be less than 40 kg.* *(g) Store should be compatible for carriage on existing Bomb Racks .* *(h) Bomb should be capable to be stored in open.*				
122.	**Development of Electronic Fuzes with either impact, delay and impact cum delay settings for Aerial Bombs.**	10	3000/Year	IAF
Broad Parameters/ Preferred Technologies *(a) Design and development of Proximity Fuze for Aerial Bombs. Should be capable to withstand high speed and 'G' forces during carriage and should be activated only when desired 'G' forces are attained.* *(b) Should have in built safety measures to take care of any mishandling during transportation and handling of the fuze. Indication system should be available on the body to assess whether the fuze is unsafe or safe.* *(c) Shelf life of at least 10 years and exposed life of one year when stored at a temperature of 25± 2° C and RH up to 70%.* *(d) Should be safe for transportation by all modes of transport.* *(e) For Electronic Fuze, delay mechanism and instantaneous functioning should coexist. Delay mechanism should have a multiple choice (minutes to 72 hours).*				

Ser	**Programme / Project**	**Expected Life Cycle of Equipment (Yrs)**	**Approx Quantity**	**Amplifying Remarks (If Any)**
(f) For Proximity Fuze, the fuze should function at nominal height of 10 metres. The fuze should function in impact mode in case of failure in proximity mode. *(g) Electronic fuzes should be adaptable to all conventional bombs.* *(h) Should be EMI/EMC compliant.*				
123.	**LRGB**	15	5000	Air Force
Broad Parameters/ Preferred Technologies. Max Range should be around 100 km when released from 42000 ft, Types of warhead – Blast fragmentation and Penetration, High accuracy, High shelf life, Operation, Transportation and storage in Indian conditions.				
124.	**ER Guided Munitions (127 mm and above)**	25	2000	Navy **POC-PDSR** **011-23011680**
Broad Parameters/ Preferred Technologies. The ammunition should have a range of not less than 70 km with seeker, control system and suitable fuse and warhead for capability against missiles, aircraft, ships, armour, ground targets and personnel.				
125.	**Chaffs & Flares**	10	All large numbers	Air Force
Broad Parameters/ Preferred Technologies. The chaffs & flares are intended to effectively provide self-protection to the platform against radar controlled weapon and IR seeking weapons respectively. Chaffs is a form of volumetric radar reflecting material that is composed of distributed metalised reflectors made of very thin radar reflecting material, such as aluminium foil, which has been cut to length of approximate one half wavelength of radar frequency band. Flares are designed to be effective against infrared (IR seeking missile). Chaffs intended to be developed are under three sizes viz 26mm, 50mm & 1"x1"x8".				
126.	**Flares & Chaffs for Helicopters**	15 Yrs	Flares - 4,00,000	Army

Ser	Programme / Project	Expected Life Cycle of Equipment (Yrs)	Approx Quantity	Amplifying Remarks (If Any)
			Chaffs ï 2,00,000	
Broad Parameters/ Preferred Technologies. Flares and Chaffs form integral component of Electronic Warfare Suite (EW Suite) fitted on helicopters to increase survivability in tactical battle field area. These are dispensed once the EW Suite detects an Anti Aircraft Missile threat to lure the missile away from the aircraft by painting a false target. *(a) **Flares**. Flares should be capable of producing higher intensity radiation than the radiation intensity of the aircraft in IR wavebands. Flares should have ejection velocity of 25-50m/sec with physical attributes of 1" x 1" x 8" for compatibility with legacy dispensing systems.* *(b) **Chaffs**. Chaffs with physical attributes of 1" x 1" x 8" for compatibility with legacy dispensing systems should be capable of producing cloud of aluminium / metallised by painting a false target larger than the Radar Cross Section (RCS) of the helicopters in service.*				
127.	**Active Off-Board Decoy**	25	More than 100	Navy **POC-PDSR** **011-23011680**
Broad Parameters/ Preferred Technologies. The decoy should be launched from existing Chaff systems of ships with 130mm caliber. It should have a persistence time of not less than 10 min. It should be able to mimic RF transmissions of Anti ship missiles and provide alternate/ larger target to seduce the missile. Persistence time of 25 min.				
128.	**155MM Trajectory Correctible Munition TCM/ Course Correctible Fuze (CCF)**	15	4000	Army
Broad Parameters/ Preferred Technologies. Concept of CCF hinges on exploiting the existing inventory of munitions. The fuze has GPS and micro controller which guide / correct the projectile towards the ranging				

Ser	**Programme / Project**	**Expected Life Cycle of Equipment (Yrs)**	**Approx Quantity**	**Amplifying Remarks (If Any)**
point. CCF should be compatible with all calibres of 155mm i.e 39/45/52 and should have the capability to be guided by GPS/INS with CEP less than 50m.				
129.	**Fuzes for 76 mm Guns and above**	25	4000	Navy **POC-PDSR 011-23011680**
Broad Parameters/ Preferred Technologies. Fuses for use against missiles, aircraft, ships and ground targets for 76mm guns and above.				
130.	**7.62 mm Ammunition for sniper rifle**	-	Large numbers	Air Force
Broad Parameters/ Preferred Technologies. 7.62mm NATO Armoured piercing rounds compatible with Galil Sniper Rifle, Subsonic rounds compatible with Galil Sniper Rifle				
131.	**5.56 mm Ammunition for LMG**	-	Large numbers	Air Force
Broad Parameters/ Preferred Technologies. 5.56 mm NATO belted/linked Ammunition compatible with Negev LMG				
132.	**5.56 mm ammunition for Assault Rifle**	-	Large numbers	Joint
Broad Parameters/ Preferred Technologies. 5.56 mm NATO Ammunition compatible with Tavor Assault Rifle.				

Ser	Programme / Project	Expected Life Cycle of Equipment (Yrs)	Approx Quantity	Amplifying Remarks (If Any)
	SUPPORT AND SMALL ARMS			
133.	**Light Weight Anti Material Rifle**	10	More than 2000	Army
Broad Parameters/ Preferred Technologies. 12.7mm Calibre. Effective range not less 1800 m. Muzzle velocity of 850m/s. Weight less than 12 Kg. Picatinny rails for mounting the sights.				
134.	**Assault Rifle**	10	More than 2,50,000	Joint
Broad Parameters/ Preferred Technologies. 7.62 X 51 mm Calibre. Effective range of 500 m. Weight less than 4 Kg. Picatinny rails for mounting the sights.				
135.	**Protective Carbine**	10	More than 2,30,000	Joint
Broad Parameters/ Preferred Technologies. 5.56 X 30 mm Calibre. Effective range of 100 m. Weight less than 3 Kg. Picatinny rails for mounting the sights.				
136.	**Sniper Rifle**	10	More than 6000	Joint (Army & Air Force)
Broad Parameters/ Preferred Technologies. 8.6mm Calibre. Effective range not less 1200 m. Weight less than 8 Kg. Based on operating mechanism of Bolt action principle. Picatinny rails for mounting the sights.				

Ser	Programme / Project	Expected Life Cycle of Equipment (Yrs)	Approx Quantity	Amplifying Remarks (If Any)
		SENSORS		
Radars				
137.	**Aerostat System**	10-15	5-10	Air Force
Broad Parameters/ Preferred Technologies. 15000 feet or more above Mean Sea Level (AMSL). Maximum duration on station, without any lifting gas refill during this period. Mooring system should be fabricated out of marine grade anti-corrosive steel, which should be able to withstand Indian Standard Atmospheric condition. Tether featured and physical characteristics including life span of the tether in terms of number of launches and recoveries. Parameters required to monitor the health and status of balloon should be displayed for monitoring by the ground crew. Numerical data for winds should be displayed.				
138.	**Passive Weapon Acquisition System**	20	70	Army
Broad Parameters/ Preferred Technologies. State of the Art, Passive Weapon Acquisition Systems to augment the Target Acquisition by RPAs, satellites/Aerial Photos and Weapon Locating Radar. System could be a mix of diverse technologies like Sound Ranging System and Unattended Ground Sensor and Flash Spotter. Should provide continuous 24 hours coverage. Consists of sensor posts which could include sensors with wireless links and power supply units and command posts which may consist of ruggedized laptops and accessories for communication links, printing and interface with the Battle Field Surveillance System.				
139.	**Multi-functional Dual Band Radar**	15	40	Navy **POC-PDSR 011-23011680**
Broad Parameters/ Preferred Technologies. The radar should provide air and surface surveillance and also be capable of controlling delivery of ordnance (Missiles and Guns). It should be phased array radar with electronic beam steering and stabilisation capability. It should be modular and easy to maintain and be able to be fitted onboard ships of 1000 GRT and above. Low Probability of Intercept.				

Ser	**Programme / Project**	**Expected Life Cycle of Equipment (Yrs)**	**Approx Quantity**	**Amplifying Remarks (If Any)**
140.	**High Power Radars**	30	12-15	Air Force
Broad Parameters/ Preferred Technologies. Active Aperture Phased Array Radar based on solid state Trans/Receive modules. Ability to scan 360 in azimuth in surveillance mode using static (non-rotating) three / four facet antenna. Maximum detection range for a target of Radar Cross Section (RCS) of 2 m^2 with Probability of Detection (Pd) of 0.9 and Probability of False Alarm Rate (PFA) of 10^{-6}. Ability to resolve target in four dimensions (4D) namely Range, Azimuth, Height and Doppler Velocity.				
141.	**Doppler Weather radar 'X' band**	15 yrs	> 15	Navy **POC-PDNOM 011-21410476**
Broad Parameters/ Technologies. For fitment on platforms capable of operating aircraft. *Weather RADARs help in **Nowcasting** and in identification of approaching storms. This equipment is required for Aircraft carriers and all platforms having integral Helos. The Marine version of 'X' Band weather RADAR should weigh less than 01 Ton; operate within the frequency of 0.8-1.0 GHz and be capable of being installed on any lattice mast onboard ships. The typical range of the radar should be at least 100 km with an antenna size of 2.0 m approx.*				
142.	**Bird Monitoring & Detection Radar (BMDR)**	15-20	Limited numbers	Joint (Navy & Air Force)
Broad Parameters/ Preferred Technologies. Static, Mobile or Portable. (Field deployable). The cabin/shelter/Equipment should be towable (using commonly available vehicle like tractor). Radar should be deployable at all altitudes in India, presently the highest airfield is Leh with an elevation of 10682 feet. Maximum duration on station (for non-stop operations). Should withstand weather conditions encountered across India. Ease of deployment (ease of operating jacks, standard levelling procedures etc.)				

Ser	Programme / Project	Expected Life Cycle of Equipment (Yrs)	Approx Quantity	Amplifying Remarks (If Any)
Sonars and Sonobuoys				
143.	**Submarine Sonar Suite**	25	10	Navy **POC-PDSMAQ 011-23011067**
Broad Parameters/ Preferred Technologies. Integrated sonar suite will consist of Passive Sonar, Active Sonar, Intercept Sonar, Winch – able passive Towed Array Sonar, Mine Avoidance Array (MAA) sonar for Mine Avoidance functions, Sound Velocity Recorder, Underwater Telephone with NCO capability, SIP with DEMON and LOFAR analysis, Sonar Simulator, Flank Array Sonar and Built – in test equipment				
144.	**DIFAR/DICAS/Bathy Sonobuoys**	10		Navy **POC-PDSR 011-23011680**
Broad Parameters/ Preferred Technologies. Since the project is being pursued by NPOL, the numbers would be decided on success of TD project. *Sonobuoys must have the facility of command functions like toggle VHF Tx power on/ off, change of RF channel and depth variation of hydrophone. There are three types of the sonobuoys as per slandered NATO nomenclature viz, DIFAR – passive directional buoy, DICASS – active sonobuoy that is command activated and Bathy buoy – that generated temperature/ velocity profile of sea water upto a specified depth (400-600 m) The sonobuoys should be considered for development for both Eastern and Western origin aircraft. The development of the sonobuoys could be based on the existing design with better sensor performance and utilise the existing drop system.*				
145.	**Sonar Transducer with Polyurethane Element**	10	25	Navy **POC-PDSMAQ**

Ser	**Programme / Project**	**Expected Life Cycle of Equipment (Yrs)**	**Approx Quantity**	**Amplifying Remarks (If Any)**
				011-23011067
Broad Parameters/ Preferred Technologies. Sonar transducer based on composite materials that give high radiation of power for a given surface area as well as design of desired projector shapes. The transducer should be capable of generating/ receiving power in the frequency range 3-4.5 Khz. The gain in power should be at least 50% more than the present sonars in the IN.				
146.	**Conformal Array**	20	More than 10	Navy **POC-PDSR 011-23011680**
Broad Parameters/ Preferred Technologies. The conformal array is envisaged to operate in frequency below 2 KHz. The array size should be optimized for installation onboard Frigates and Destroyers without affecting their draught and design aspects. The array should be capable of integration with processing system in IN after minimal changes. The array should be able to be installed onboard Destroyers and Frigates in-service within the constraints of the extant sonar dome area.				
147.	**Thin Line Array**	10	20	Navy **POC-PDSR 011-23011680**
Broad Parameters/ Preferred Technologies. The thin line array should be less than 55 mm in dia and capable of being operated by vessel of less than 100 tons. Should be capable of detecting conventional submarine in littorals (within 200 m of depth). The array along with workstation should be portable in nature such that for each deployment the system should be capable of being shifted from shore based stowage to towing unit. The array should operate in frequency range from 100 to 4000 Hz and have requisite classification tools. The array should be able to undertake bi-static operations with low frequency transmissions being undertaken by separate source in frequency range of less than 2000 Hz.				

Ser	**Programme / Project**	**Expected Life Cycle of Equipment (Yrs)**	**Approx Quantity**	**Amplifying Remarks (If Any)**
Electro Optics In addition to the equipment listed below, electro optics technology has also been sought for systems and platforms included elsewhere in this TPCR like **tanks, aircraft, RPAs etc**.				
148.	**EOIRST**	15	100	Navy **POC-PDSR 011-23011680**
Broad Parameters/ Preferred Technologies. The system should be able to carry out passive search, detection and tracking of air and surface targets with day and night capability using its thermal imagers, CCD cameras and Laser Range Finders even under conditions of zero visibility. It should provide detection of small surface targets in search mode at greater than 20 km.				
149.	**Long Range Electro Optical Sensors**	10	200	Navy **POC-PDSR 011-23011680**
Broad Parameters/ Preferred Technologies. A Gen 4 multi sensor EO/IR payload for helicopters, RPAs and MR aircraft. The system should essentially conform to all the features of a modern system with good standoff ranges. High definition Low Light TV, IR sensor and a telescopic type sensor for long range detection should also be incorporated in the system. The display should have the capability to present an integrated output to the operator.				
150.	**TI Sights**	10-12	55,000	Army
Broad Parameters/ Preferred Technologies. Minimum Focal Plane Array (FPA) of 640 x 512 with pitch of min 17 microns or less, uncooled, micro bolometer detectors. ***Detection and Recognition Parameters***.				

Ser	Programme / Project	Expected Life Cycle of Equipment (Yrs)	Approx Quantity	Amplifying Remarks (If Any)

TI Sight	*Detection (in metres)*	*Recognition (in metres)*
Sight for Assault Rifle	*500*	*350*
Sight for LMG	*1000*	*700*
Sight for MMG	*1500*	*700*
Sight for AGL	*700*	*500*
Sight for AMR	*1500*	*700*

151.	**Image Intensifier Sights**	10-12	180000	Army

Broad Parameters/ Preferred Technologies. Min FoM 1700, 3rd Generation.

Detection and Recognition Parameters.

II Sight	**Detection (in metres)**	**Recognition (in**
Sight for Assault Rifle	500	300
Sight for LMG	1000	700

152.	**Advanced Optical Theodolite (AOT)**	20	150	Army

Broad Parameters/ Preferred Technologies. AOTs are used to enable alignment on a common grid for orientation. Field of View > $1^0$20 minutes, Magnification ≥ 20 times, Digital Compass ≤ 3 mils, Laser Range Finder, Digital display, Rechargeable Battery and Mil Grade.

Night Vision Devices - In addition to the equipment listed below, night vision technology has also been sought for systems and platforms included elsewhere in this TPCR like **tanks, aircraft, RPAs etc**

153.	**Helmet Mounted NVBs**	15	Large Numbers	Joint (Navy & Air Force)

Ser	**Programme / Project**	**Expected Life Cycle of Equipment (Yrs)**	**Approx Quantity**	**Amplifying Remarks (If Any)**
				POC-PDSR 011-23011680
Broad Parameters/ Preferred Technologies. The equipment should be less than 1 kg, snug fit, water and weatherproof. It should be capable of being fitted on existing helmets. It should be capable of detecting and identification in pitch dark conditions.				
154.	**Next Generation Night Vision Devices (IR/ Thermal Imaging)**	10	Large Numbers	Joint (Navy & Air Force) **POC-PDSR 011-23011680**
Broad Parameters/ Preferred Technologies. The device should be handheld and provide, even in zero visibility conditions, day and night detection and recognition capability against small surface crafts, aircraft and personnel.				

Ser	Programme / Project	Expected Life Cycle of Equipment (Yrs)	Approx Quantity	Amplifying Remarks (If Any)
COMBAT ENGINEERING				
Mine Warfare				
155.	**Mine Field Breaching Equipment**	700-1000 Km of breaching	40 Sets	Army
Broad Parameters/ Preferred Technologies. Should be able to clear pressure actuated, double action, influence and tilt rod mines to provide a approximately 4m wide safe lane for vehicles. There should be not more than four pieces of equipment in one set. The equipment should clear at least 90% mines in one pass and minimum breaching speed should not be less than 3 KMPH in deserts. Installation/ handling of equipment should be possible using in-service cranes. To be mounted on in-service tank/ on a suitable platform.				
156.	**Vehicle Based Mine Scattering System**	15	150	Army
Broad Parameters/ Preferred Technologies. The equipment is required to dispense mines from a vehicle to rapidly lay mines. In-service high mobility vehicle mounted system capable of dispensing at least 600 anti-tank mines while travelling at a speed of 10 KMPH without replenishment. The system should be capable of functioning in auto/ manual mode and recording the data on digitised maps.				
157.	**Minefield Recording System**	10-15	3500 sets	Army
Broad Parameters/ Preferred Technologies. The equipment is required to accurately record the location of mines laid in all types of terrain. The system should be able to plot and record coordinates of the location of mines laid to an accuracy of 4cm or better, in latitude/ longitude and military grid system using symbology and data in graphical as well as tabular format. The equipment should integrate satellite based positioning data with digitised maps and Geographical Information System to record/ retrieve data in a near real time. The equipment should be man portable and secure.				
158.	**Equipment for Detection of Buried Objects**	10	20	Army

Ser	Programme / Project	Expected Life Cycle of Equipment (Yrs)	Approx Quantity	Amplifying Remarks (If Any)
Broad Parameters/ Preferred Technologies. Equipment will be utilised for detection of mines, improvised explosive devices (IEDs)/ caches from a standoff distance. Capable of scanning an area from a standoff distance of minimum 5000 feet and detecting mines buried underground. Minimum diameter of mines which the equipment should detect would be approximately 50 mm. The equipment should also be capable of detecting underground IEDs and caches. Equipment should be capable of being utilised in vehicle mounted or helicopter/ RPA configuration. Output of the equipment/ sensors should be real time.				
Bridging				
159.	**Heliportable Bridge**	25-30	20	Army
Broad Parameters/ Preferred Technologies. To be utilised in mountains/ inaccessible areas. The bridge should be made of light weight/ composite material. Equipment should be capable of being transported by in-service helicopters, in palletised/ under slung mode. 10m fully constructed bridge should be capable of being transported in under slung mode. It should be modular in design to enable varied configurations.				
160.	**Logistic Support Bridge**	30	50 sets.	Army
Broad Parameters/ Preferred Technologies. Bridge made of modular parts, enabling construction in different configurations of load carrying capability and span. The equipment should be capable of sustaining Military Load Classification (MLC) 70. The equipment should be capable of being constructed for one/ two way traffic as single/ double lane bridge. Bridge parts should allow manual handling by a maximum of six personnel per modular part.				
161.	**Aerial Cableway**	15	40 sets	Army
Broad Parameters/ Preferred Technologies. To be utilised for transportation of loads & personnel in mountainous, high altitude/ glaciated terrain. Mechanically operated aerial ropeway capable of carrying loads upto 150 kg, upto a span of 800m. The equipment should be able to negotiate slopes upto 60 degree and capable of operating upto an altitude of approximately 5500m. Design and modularity of the equipment should				

Ser	**Programme / Project**	**Expected Life Cycle of Equipment (Yrs)**	**Approx Quantity**	**Amplifying Remarks (If Any)**
enable manual transportation/ construction in areas of employment in a quick timeframe.				

Ser	**Programme / Project**	**Expected Life Cycle of Equipment (Yrs)**	**Approx Quantity**	**Amplifying Remarks (If Any)**
CBRN AND FIREFIGHTING				
162.	**Decontamination System**	30	300	Army
Broad Parameters/ Preferred Technologies. The Decontamination System should enable decontamination of personnel, equipment, vehicles and infrastructure against all forms of nuclear and chemical contamination. The decontamination system should be mobile and able to operate in all environments.				
163.	**CBRN Water Purification Equipment**	30	200	Army
Broad Parameters/ Preferred Technologies. Provide potable water to the dependent units in a CBRN environment. Should be able to purify water which has been contaminated by radiation fallout, chemical and biological agents. The equipment is to be mounted on an in-service vehicle.				
164.	**Ship Installed Radiac System (SIRS)**	15	35 ï 40	Navy **POC-PDNBCD 011-23793514**
Broad Parameters/ Technologies. *To be integrated with the Battle Damage Control System (BDCS), as part of Integrated Platform Management Systems (IPMS), wherever available*				
165.	**Ship Installed Chemical Agent Detection System (SICADS)**	15	35 ï 40	Navy **POC-PDNBCD 011-23793514**
Broad Parameters/ Technologies.				

Ser	**Programme / Project**	**Expected Life Cycle of Equipment (Yrs)**	**Approx Quantity**	**Amplifying Remarks (If Any)**
Based on latest Ion Mobility Spectrometry (IMS) based technology. To be integrated with the Battle Damage Control System (BDCS), as part of Integrated Platform Management Systems (IPMS), wherever available				
166.	**Addressable Flood Alarm System (AFAS)**	15	60	Navy **POC-PDNBCD 011-23793514**
Broad Parameters/ Technologies. *Advance system with Ethernet connectivity for instant detection and feedback system of water ingress. To be integrated with the Battle Damage Control System (BDCS), as part of Integrated Platform Management Systems (IPMS), wherever available.*				
167.	**Addressable Fire Detection System (AFDS)**	15	60	Navy **POC-PDNBCD 011-23793514**
Broad Parameters/ Preferred Technologies. *Advance system with Ethernet connectivity for instant detection and feedback of smoke/ flames. To be integrated with the Battle Damage Control System (BDCS), as part of Integrated Platform Management Systems (IPMS), wherever available.*				
168.	**Magazine Fire Fighting System (MFFS)**	20	> 100	Navy **POC-PDNBCD 011-23793514**
Broad Parameters/ Preferred Technologies Automatic fire/ smoke detection system for magazines based on Ethernet connectivity for real time detection and feedback and activating of fire extinguishing measures.				

Ser	**Programme / Project**	**Expected Life Cycle of Equipment (Yrs)**	**Approx Quantity**	**Amplifying Remarks (If Any)**
169.	**DC Training Facilities**	25	3-4	Navy **POC-PDNBCD 011-23793514**
Broad Parameters/ Preferred Technologies. To undertake training on Fire Fighting and Damage Control under simulated conditions of ships				
170.	**FF Training Facilities**	25	3-4	Navy **POC-PDNBCD 011-23793514**
Broad Parameters/ Preferred Technologies. To undertake training on Fire Fighting and Damage Control under simulated conditions of ships				

Ser	Programme / Project	Expected Life Cycle of Equipment (Yrs)	Approx Quantity	Amplifying Remarks (If Any)
	EW AND COMMUNICATIONS			
171.	**Integrated EW System**	12	10 systems	Army
Broad Parameters/ Preferred Technologies. It involves development of multifunction EW system with Active Phase Array. The integrated system should have small size, weight and power requirements. It should be modular and be possible to mount on HMVs or tracked vehicles (BMPs) for employment in plains and deserts.It should be an analysis based EW system with state of the art Decision Support System employing heuristics analysis that utilize policy based technology like Policy Administration Point (PAP). The system must be able to detect, classify, locate and monitor communication targets (FF, Burst & FH) in deserts and plains. Should be able to: - *(a) Deny effective use of spectrum (Fixed Frequency (FF), Burst and Frequency Hopping (FH)) in plain terrain.* *(b) Detect, monitor, locate and jam enemy cellular receivers and satellite communication receivers.* *(c) Detect low Probability of Intercept Radars with precision and jam these radars.* *(d) Carry out multiprotocol target detection, classification, identification, locating and jamming.* (e) *Should have demodulation, decryption and voice recognition software tools built in the system.*				
172.	**Heliborne EW System**	12	07 systems	Army
Broad Parameters/ Preferred Technologies. This project will involve development of an integrated Helicopter borne system for tactical use. *(a) The system must be of small size, weight and be able to function with available on board power supply.* *(b) Communication Intelligence (COMINT) capability including Electronic Support Measures (ESM) and Electronic Counter Measures (ECM), FF, Burst and FH.* *(c) The system should be able to detect, monitor, locate and jam cellular communication of the adversary.* *(d) Capability of Electronic Intelligence (ELINT) including detection of Low Probability of intercept (LPI)*				

Ser	Programme / Project	Expected Life Cycle of Equipment (Yrs)	Approx Quantity	Amplifying Remarks (If Any)
radars and jamming.				
173.	**Aerostat Based EW System**	12	03 systems	Army
Broad Parameters/ Preferred Technologies. (a) An aerostat based EW system should be developed to provide longer ground ranges and function from a standoff distance of over 40-50 km. *(b) The system should provide an integrated solution against communication and non-communication signals.* *(c) Should be able to detect, monitor, locate and jam enemy cellular networks & satellite terminals.* *(d) The system should integrate photo recce and image correlation for physical identification of targets.* *(e) The system should be able to carry out jamming & spoofing of satellite based positioning systems.*				
174.	**EW Payload for RPA**	12	10	Army
Broad Parameters/ Preferred Technologies. The project involves designing of SWAP, modular COMINT & ELINT payloads for RPAs to improve situational awareness of commanders. *(a) COMINT and ECM from 1.5 MHz to 8 GHz.* *(b) ELINT and ECM from 1 GHz to 40 GHz.* *(c) Range should be 40-50 KM.*				
175.	**EW Suite for Medium Lift Helicopters**	15-20	Limited numbers	Air Force
Broad Parameters/ Preferred Technologies. EW suite comprising Radar Warning Receiver (RWR), Missile Approach Warning System (MAWS), Counter Measure Dispensing System (CMDS), Laser Warning Receiver (LWR) and Directed Infrared Counter Measure (DIRCM) are intended to be integrated in order to provide capability of intercepting, identification, prioritisation and display of airborne and ground based threat from radars and missiles to the pilot and provide self-protection to the helicopter.				
176.	**Passive Surveillance System**	20-25	Limited numbers	Air Force
Broad Parameters/ Preferred Technologies. The passive surveillance system (PSS) should be capable of				

Ser	Programme / Project	Expected Life Cycle of Equipment (Yrs)	Approx Quantity	Amplifying Remarks (If Any)
generating 3D air situation picture by providing multi-channel passive accurate location and dynamic tracking of airborne targets. The system should be capable of detecting, intercepting, locating, identifying and tracking of active and passive emissions from the targets. It should comprise of Remote Receiving Stations (RRSs) and a Master Receiver and Control Station (MRCS). The MRCS should be capable of generating a 3D fused picture based on the inputs from RRSs. The fused air situation picture should be sent to Integrated Air Command and Control System (IACCS) of IAF for multi sensor tracking. The PSS system should be able to provide Electronic intelligence (ELINT) information of the tracked targets and provide identification of type of aircraft based on the threat library.				
177.	**IFF Mk XII (S)**	20	More than 1200	Joint (Army and Navy)
Broad Parameters/ Preferred Technologies. IFF Mk XII(S) is an equipment for identification of friend & foe ac, to be employed by all three services. The equipment should have ground/ surface based interrogators & transponders. The weight & dimension of equipment should be commensurate with the limitations of the platform. The equipment should be fully compliant to STANAG 4193 & ICAO Annexure 10. System should have Built-In Test (BIT) functions. The equipment should have long/med/short range interrogator facility. The transponders should be capable of identify itself to various integrating platforms.				
178.	**Army Strategic Backbone Communication Network**	10	One system	Army
Broad Parameters/ Preferred Technologies. The strategic network shall be Pan-India Network which shall provide secure backbone IT & Communication support required for running various services and applications of Indian Army. It shall consist of various sub-systems and should be managed through a state-of-art Unified Network Management System established at Network Operations Centre.				
179.	**S BAND SATELLITE TERMINALS**	10-15	More than10,000	Army
Broad Parameters/ Preferred Technologies. Handheld, Manpack and SATCOM Messaging terminal using S Band. IRNSS capability to be incorporated				

Ser	Programme / Project	Expected Life Cycle of Equipment (Yrs)	Approx Quantity	Amplifying Remarks (If Any)
180.	**5 KW HF Transmitter**	13	More than 75	Navy **POC- PDNS 011-23011445**
Broad Parameters/ Preferred Technologies. 5 KW HF Tx for shore based communication stations to meet the ship shore/ broadcast requirements of Indian Navy. The set should provide both voice and high speed data communications. The set should also incorporate the latest technologies in the field of HF communications including ALE.				
181.	**HF Sets**	15-20	Medium numbers	Air Force
Broad Parameters/ Preferred Technologies. Compact and man portable single unit HF sets with weight 10 Kg or less and ability to operate 230V ,50Hz single phase with ability to operate on 11-30 V DC. Frequency of operation from 2 to 29.999 M Hz. Pre-set channels and effective communication range with simplex or semi-duplex press to talk with anti-jamming facility of voice encryption and frequency hopping.				
182.	**Light Weight Man Portable HF Sets**	15-20	Medium numbers	Air Force
Broad Parameters/ Preferred Technologies. The form factor of the HF set should be compact and 19" rack mountable. The HF set should be modular with plug-in assemblies. All the Line Replacement Units (LRU) and associated units like High Speed Data Modem, ALE etc. Should be housed preferably in the same rack with railing/ slides for easy accessibility to Bottom/Rear portions. 2 to 30 MHz (Variable). Equipment should be tuneable to any frequency within the specified range. Minimum 50 pre-set / pre-set/pre-programmed channels. FM, AM, Digital modulation.				
183.	**Communication System and sets for Submarines**	25	>10	Navy **POC-PDSMAQ 011-23011067**

Ser	**Programme / Project**	**Expected Life Cycle of Equipment (Yrs)**	**Approx Quantity**	**Amplifying Remarks (If Any)**
Broad Parameters/ Preferred Technologies. (a) *Advanced Composite Communication Suite with transmitter/ receiver integrated and intelligent communication control* *(b) TWA & TSCB for dived V/UHF/HF/VLF/GPS/IRNSS/ SATCOM.* *(c) Satellite communication system, with Ku Bank 'S' Band and UHF capability 'L' Band capability for 'Technical Communications with SDRs'.*				
184.	**Tethered Submarine Buoy**	25	>10	Navy **POC-PDSMAQ** **011-23011067**
Broad Parameters/ Preferred Technologies. Technology to ensure a payload having capability for V/UHF, SATCOM, GPS, L- Band etc.				
185.	**Indigenous SATCOM Systems (Various Bands)**	15	> 250	Navy **POC-PDNSO** **011-23015216**
Broad Parameters/ Technologies. *For fitment on various types of Ships.*				
186.	**INMARSAT Maritime voice cum high speed data terminal (FBB 500)**	15	> 50	Navy **POC-PDNSO** **011-23015216**
Broad Parameters/ Technologies.				

Ser	Programme / Project	Expected Life Cycle of Equipment (Yrs)	Approx Quantity	Amplifying Remarks (If Any)
For fitment on various types of Ships.				
187.	**Mobile Satcom & Tropo Terminal (MSTT)**	15-20	150-200	Air Force
Broad Parameters/ Preferred Technologies. Containerised, vehicle mounted, vehicle should have all wheel drive, off road capability and meet the requirements of deployment at terrains upto 3500 m AMSL. Vehicle Axle weight should be 5890 Kg or less.				
188.	**Mobile CADF**	20	15-25	Air Force
Broad Parameters/ Preferred Technologies. Long range new generation with continuous operation basis with VHF and UHF band with frequency stability and channel spacing and polarisation, vertical spacing, Data interface and data rate with radio meeting EMI/EMC standards.				
189.	**High Capacity Radio Relay (HCRR)**	15-20	More than 2000	Army
Broad Parameters/ Preferred Technologies. The Radio Relay equipment should provide a data rate of at least 100 Mbps with communication ranges of up to 30 kms. It should be possible to operate in both point to point and point to multi point modes. It would be based on a Outdoor unit and Indoor unit configuration. The IDU is expected to have base band interface (E1, E3, IP, Optical etc) on the IDU. The ODU should be ruggedized to cater for JSS-55555 requirements.				
190.	**Laser Based Communication Systems**	12 - 15	30 to 40	Navy **POC- PDNS 011-23011445**
Broad Parameters/ Preferred Technologies. The communication system would provide secure two way communications between naval units.				
191.	**Software Defined Radio (SDR)**	15 Years	More than 60,000	Army

Ser	**Programme / Project**	**Expected Life Cycle of Equipment (Yrs)**	**Approx Quantity**	**Amplifying Remarks (If Any)**
			of all types	
Broad Parameters/ Preferred Technologies. SDRs are envisaged to be used in Handheld, Manpack, Truck/ Ground and AFV roles for ground to ground and ground to air communications, supporting voice, data and video communications with TRANSEC and COMSEC capabilities				
192.	**Cognitive Radio**	15 Years	More than 250	Navy **POC- PDNS 011-23011445**
Broad Parameters/ Preferred Technologies. It should be a radio that can be programmed and configured dynamically. Equipment should automatically detect available channels in wireless spectrums, then accordingly change its transmission or reception parameters. Cognitive Radio must monitor its own performance continuously to deliver the required quality of service.				
193.	**Hand Held Sat Phone Mobile**	10-15	Medium numbers	Joint (Navy & Air Force)
Broad Parameters/ Preferred Technologies. Dimensions (Length, Width, and height) of the hand held SAT Phone. Lightweight set including battery. High visibility colour screen. Provision available on handset for connecting with USB port, audio socket, antenna port etc. Water and dust proofing standard/rating. Voice service. Call ID, Call waiting, Call divert, Call holding, Conferencing, Call bars, speed dialling, Fixed number dialling, messaging services. Text to text, Text to e-mail.				

Ser	Programme / Project	Expected Life Cycle of Equipment (Yrs)	Approx Quantity	Amplifying Remarks (If Any)
	SIMULATORS			
194.	**Spatial Disorientation Simulator**	15-20	Limited numbers	Joint
Broad Parameters/ Preferred Technologies. The SD simulator should have the facility for biological signal transmission and recording such as ECG, Blood Pressure, pulse and oxygen saturation with capability to select the desired parameters from preparation screen. The preparation screen should enable selection from a list of predefined SD effect. The simulator should have six-degrees of freedom. The movement should be smooth with sudden stop facility. Dual cockpit with pilot adjustable seats for fighter and helicopter. Chin window to be available for landing on platforms like an oil rig.				
195.	**Full Motion Simulator Level D**	30	More than 10	Joint (Army & Navy)
Broad Parameters/ Preferred Technologies. (a) Capable of provide realistic training to pilots and weapon system operators for each type of helicopter (Advanced Light Helicopter Utility, Advanced Light Helicopter-Weapon Systems Integrated and future inductions). *(b) Catered for one mother-station with 'Roll-on/ Roll-off' cockpit.* *(c) Replicate flight envelope in terms of full scale flight deck, cockpit environment, flight dynamics, systems operation in normal and emergency modes and operations with role specific mission equipment (eg. Electronic Optical Pod, Electronic Warfare Suite, Helmet Pointing System, armament, etc.).* *(d) Simulate night and NVG training of pilots in varied terrain and weather conditions.* *(e) Six axis motion based high fidelity simulation of flight from start-up to switch-off enhanced by realistic visual and aural cues.* *(f) Should have crew stations, in addition to those for pilots, for instructor and observer.* *(g) Simulator should be capable of being networked to simulate joint maneouvres, air combat etc.* *(h) De-brief should be possible by means of replaying the sortie with full fidelity internally as well as from an external view.* *(j) Compliant with internationally laid down standards for Level D Full Flight Simulator.*				

Ser	Programme / Project	Expected Life Cycle of Equipment (Yrs)	Approx Quantity	Amplifying Remarks (If Any)
196.	**Missile Simulator for Anti Tank Guided Missile and Air to Air Missile**	15	15	Army
Broad Parameters/ Preferred Technologies. Primarily a computer based static indoor training aid, must provide the cockpit layout and controls available to the Weapon Systems Operator (WSO) and the pilot. *(b) A full scale external view as available to the WSO and pilot in the helicopter must be projected by means of a projection system.* *(c) Realistic indications on mock flight deck in accordance with laid down procedures and business logic of the target acquisition and engagement system.* *(d) Should enable the WSO to practice target detection, recognition, acquisition and engagement during day and night including NVG mode.* *(e) Targets being depicted should provide realism in terms of distance, size, shape, relative speed during engagement and be overlaid on terrain data.* *(f) The missions should be configurable in terms of weapon load, helicopter routing, flight parameters, targets, route to be followed by targets, terrain being overflown, visibility weather conditions.* *(g) De-brief of the missions should be enabled through replay of actions taken by the trainee and their evaluation vis-à-vis laid down procedures. Simulated procedure for engagement of targets by other weapon systems fitted on the helicopter be also included. Operation of Self Protection Suite in a hostile environment may also be encompassed.*				
197.	**IFATS**	15-20	Large numbers	Air Force
Broad Parameters/ Preferred Technologies. A simulator for small arms to be installed in various bases for imparting training , To run on main and standby power supply with ability to have back u for all data. It should be able to simulate varied terrain conditions, collate and analyse the scores and help marksmen ship.				

Ser	Programme / Project	Expected Life Cycle of Equipment (Yrs)	Approx Quantity	Amplifying Remarks (If Any)
	SPECIALISED VEHICLES			
198.	**Explosive Van**	10	More than 350	Joint (Army & Navy)
Broad Parameters/ Preferred Technologies. (a) *In-Service 5/7.5 MT 4x4 chassis to be basic platform for fabrication of Explosive Vans.* *(b) Should be able to carry maximum 6000 Kgs NEC (Net Explosive Content).* *(c) Fire Resisting Screen of minimum 18 SWG steel sheets lined with asbestos sheets of approx thickness of minimum 6mm between screen and the body of the van.* *(d) Vehicle to be rail transportable on broad gauge and ODC compliant.* *(e) Driver's cabin to be fitted and covered externally with 20 S.W.G / mild steel sheeting.* *(f) Flash point of the fuel in diesel engine must not be less than 38^0 C.* *(g) The operating temperature range should be between (-) 15^0 C and (-) 5^0 C and max between 40^0 C and 45^0 C.* *(h) Capable of operating in altitude upto 4500 meters above MSL.*				
199.	**Armoured Amphibious Dozer**	20	100	Army
Broad Parameters/ Preferred Technologies. The equipment should be capable of crossing water obstacles with minimal preparation. The equipment should be able to move cross country at a speed not less than 20 KMPH, and thereafter undertake earthmoving tasks. The equipment should be capable of operating a jib crane of upto 3 Ton capacity. It should have protection against Nuclear, Biological and Chemical weapons. The equipment should be capable of exiting water obstacles with steep slopes. Approximate earthmoving capability of the equipment should be as under:-				

Haulage (M)	Output (Cum/ Hr)	
	Day	Ni
25	250	230

Ser	Programme / Project	Expected Life Cycle of Equipment (Yrs)	Approx Quantity	Amplifying Remarks (If Any)
	50 180 150			
200.	**Tracked Light Dozer (TLD)**	20	150	Army
Broad Parameters/ Preferred Technologies. Heliportable dozer capable of being broken down into modular parts for rapid assembly & disassembly in field. The equipment should be capable of being broken down into smaller easily transportable loads. The TLD should be able to perform upto 4000 m above MSL. Each separate load must be within 1.5 Ton weight and dimensions (9.3m) x Width (2.27m) x height (2m).				
201.	**Light Bullet Proof Vehicle (LBPV)**	10-15	Medium numbers	Air Force
Broad Parameters/ Preferred Technologies. The engine should have a life of 1,00,000 Kms (vendor certification). The vehicle should be able to operate up to minimum 3300m elevation. The vehicle should have maximum permissible ground clearance (Minimum 215 mm). The vehicle to have short turning radius. Not less than 550 Kg (including storage of drinking water). The vehicle to have long operating range on level highways on internal fuel.				
202.	**Tractor General Purpose**	10	2000	Army
Broad Parameters/ Preferred Technologies. *4x4 Configuration.* *(b) Power steering with mechanical linkage.* *(c) Capable of operating in altitude upto 4000 mtrs above MSL.* *(d) Temperature range between (-) 15^0 C and (-) 5^0 C and maximum between 40^0 C to 45^0 C.* *(e) Minimum 4 forward and 2 reverse speed auto/ manual transmission.* *(f) Capable of adapting multiple attachments for different working modes.* *(g) Pulling capacity minimum 15 Ton.* *(h) Vehicle to be rail transportable on broad gauge and ODC compliant.*				
203.	**Crane 5/10 Ton**	15	175 - 200	Joint (Army & Air

Ser	**Programme / Project**	**Expected Life Cycle of Equipment (Yrs)**	**Approx Quantity**	**Amplifying Remarks (If Any)**
				Force)
Broad Parameters/ Preferred Technologies. (a) Turbocharged diesel Engine of minimum 130 HP. *(b) Transmission sys with minimum four fwd and two reverse speed.* *(c) Capable of operation upto 4500 meters above Mean Sea Level.* *(d) Temperature range between (-) 15^0 C and (-) 5^0 C and maximum between 40^0 C to 45^0 C.* *(e) Fully powered and hydraulically operated telescopic boom system.* *(f) Hydraulically powered slew system providing 360^0 continuous rotation.* *(g) Over-hoist and overload hydraulic cut-off for further operation upon reaching maximum safe load conditions.* *(h) Vehicle to be rail transportable on broad gauge and ODC compliant.* *(j) Capable of negotiating gradient of 1-in-5 (12^0) in un-laden condition.*				

Ser	Programme / Project	Expected Life Cycle of Equipment (Yrs)	Approx Quantity	Amplifying Remarks (If Any)
	PRACTICE TARGETS			
204.	**ATI (Air Target Imitator)**	07	Large numbers	Joint (Army Air Force)
Broad Parameters/ Preferred Technologies. ATI is a rocket projectile used as an aerial target for Infra Red (IR) homing Surface to Air Missiles (SAMs). The system should be capable of being locked on by in service IR homing SAMs & should be capable to be launched from a launcher fitted on 5/7.5 Ton in service class of vehicle. The maximum speed of the system during flight should be ≥180 meter/second with minimum flight time of 15 seconds and duration of IR source for 15 seconds.				
205.	**APTA (Advance PTA)**	Minimum 10 launch Recovery cycles or 10 Yrs shelf life	Medium numbers	Joint
Broad Parameters/ Preferred Technologies. Adv PTA is a target equipment to be used for exercises/ practice firing with or without tow bodies. It should be a booster launched, reusable airborne vehicle, deploying expendable towed target systems and deployable over land or sea. It should have a Sea Recovery & Land Recovery Version. The max operational altitude for land recovery version should not be less than 8 km for clean configuration & 4 km for tow configuration.				
206.	**Supersonic Aerial Targets**	15	10	Joint (Navy & Air Force) **POC-PDSR 011-23011680**
Broad Parameters/ Preferred Technologies. The target should be supersonic (>1.5M) and provide low RCS. It				

Ser	**Programme / Project**	**Expected Life Cycle of Equipment (Yrs)**	**Approx Quantity**	**Amplifying Remarks (If Any)**
should have a programmable flight profile including sea- skimming, with capability of AMDI/ DMDI and link for control. It should have smoke and IR flare dispensing capability.				

Ser	**Programme / Project**	**Expected Life Cycle of Equipment (Yrs)**	**Approx Quantity**	**Amplifying Remarks (If Any)**
		INFRASTRUCTURE		
207.	**Modernisation/ Augmentation of facilities at Naval Dockyards and Naval Ship Repair Yards**	15-20	Miscellaneous	Navy **POC- PDODY 011-21410480**
Broad Parameters/ Preferred Technologies. Equipment for proving shore support to ships and submarines, viz mobile cranes, material handling equipment, air compressors, rectifiers, transformers, etc.				
208.	**Installation of Major FF Systems in Naval Jetties of all Commands**	15-20		Navy **POC- PDODY 011-21410480**
Broad Parameters/ Preferred Technologies. Foam based heavy duty fire fighting systems both in fixed and mobile configuration. Capable of operation in marine environment.				

Ser	**Programme / Project**	**Expected Life Cycle of Equipment (Yrs)**	**Approx Quantity**	**Amplifying Remarks (If Any)**
MATERIALS AND PAINTS				
209.	**Camouflage Equipment for Personnel , Vehicles and Equipment**	120 usages	22,000 in various sizes	Army
Broad Parameters/ Preferred Technologies. The equipment should be able to camouflage personnel, equipment and vehicles in the visual, near infra-red, infra-red, thermal and radar ranges with minimum 70% effectiveness.				
210.	**Steel for Submarine**	More than 25 years		**Navy POC-PDSMAQ 011-23011067**
Broad Parameters/ Preferred Technologies. Development of high yield strength indigenous high tensile steel, bulb bars and weld consumables for submarine application steel (YS<780 MPa).				
211.	**Active Mounts for Machinery**	7-10	More than 10 sets	Navy **POC- PDME 011-23011713**
Broad Parameters/ Preferred Technologies. Development and effectiveness of mounts for speed dependent machinery to achieve attenuation of low frequencies (< 50 Hertz) of vibration across mounts. The life span and maintenance envelop of Active Mounts is desired to be enhanced than the existing S&V mounts being utilized below equipment/ machinery onboard ships/ submarine.				
212.	**Multispectral Camouflage Paint (MSCP)**	10	10000 litres per year	Army

Ser	**Programme / Project**	**Expected Life Cycle of Equipment (Yrs)**	**Approx Quantity**	**Amplifying Remarks (If Any)**
Broad Parameters/ Preferred Technologies. The equipment should be able to provide protection to the equipment, vehicles and tanks in the visual, infra-red and thermal bands.				
213.	**Hull Paints**	15		Navy **POC-PDNA 011-21410483**
Broad Parameters/ Preferred Technologies. Development of Solvent free long life epoxy paints for internal and external areas of submarine with a service life of at least 15 years. The internal paints scheme should have flame and fire retardant properties and should not emit any toxic gases. The paint scheme should be surface tolerant for application on moist and poorly prepared surfaces.				
214.	**Paints / Coatings**	7-10		Navy **POC-PDNA 011-21410483**
Broad Parameters/ Preferred Technologies. Development of Broad band Radar absorbing coating and composites using nano materials which is resistant to seawater immersion, Density <2.5 g/cc and > 10dB attenuation in the frequency range 2-40 GHz. The life of the coating / material should be greater than 7 years.				

Ser	Programme / Project	Expected Life Cycle of Equipment (Yrs)	Approx Quantity	Amplifying Remarks (If Any)
	MISCELLANEOUS			
215.	**Counter Measure Dispensing System/Directional Infra Red Counter Measure System**	15	More than 200	Joint
Broad Parameters/ Preferred Technologies. Counter Measures System for all aircraft such as counter Measured Dispensing System(CMDS), Directional Infra Red Counter Measures (DIRCM) system and towed decoy system for self defence for fighter, helicopters and MR aircraft against active radar and passive IR guided anti- aircraft missiles.				
216.	**Decoy for Wake Homing Torpedo**	20	More than 500	Navy **POC-PDSR 011-23011680**
Broad Parameters/ Preferred Technologies. The decoy for wake homing torpedo should be expendable in nature and capable of seducing modern wake homing torpedoes. The decoy should be capable of deployment from Maareech Launcher. The same decoy should be capable of seducing active/ passive homing torpedoes.				
217.	**Demilitarization Plant for Explosive Disposal**	20	01	Navy **POC- PDONA 011-26192845**
Broad Parameters/ Preferred Technologies. De-militarization plant is to cater for disposal of Naval explosive stores which have been declared obsolete/ unserviceable for further use. *(a) Warhead of missiles, Torpedoes, Rockets, Mines etc weighing from 1 kg to 700 kgs (NJet Explosive Content) and 1000 Lbs.* *(b) Small arms ammunition of caliber ranging from 5.56 to 20mm.*				

Ser	Programme / Project	Expected Life Cycle of Equipment (Yrs)	Approx Quantity	Amplifying Remarks (If Any)
(c) Naval Gun Ammunition from 20 mm to 130 mm caliber. *(d) Propellant of various sizes (pellet, grains, sticks etc).* *(e) Rockets I chaff ammunition of caliber ranging from 100 to 140 mm.* *(f) System should be capable of delivering the output materials (scrap) from the disposal process to segregate separate its basic components like brass, steel. Aluminum etc.*				
218.	**Upper Air Sounding System (UASS)**	10 Yrs extendable up to 12 years with upgrades	UASS > 50 Systems More than 20,000 Radiosonde per year	Joint **POC-PDNOM 011-21410476**
Broad Parameters/ Preferred Technologies. Broad Parameters/ Technologies. *Upper Air Sounding System (UASS) is used to measure the upper atmospheric weather parameters viz., Pressure, Temperature, Humidity, wind speed and wind direction. Each system should comprise of Ground Receiving Station (permanent item), 200 number Radiosondes (consumables) and 200 number 250 gm balloons. The consumable nature items are required to be stowed in an air conditioned room.*				
219.	**Hydrogen Generator for IN Met Offices**	12 Yrs, extendable up to 15 years with upgrades	>30	Navy **POC-PDNOM 011-21410476**
Broad Parameters/ Preferred Technologies. Hydrogen Gas Generator for use with UASS. *The upper atmospheric observations are taken by attaching Radiosondes to hydrogen filled balloons and releasing them. To ensure availability of hydrogen onboard, a safe and environmental friendly hydrogen generation system through electrolysis technology is required for all ships installed with UASS. The Hydrogen generation cabin will have spark proof fittings and facility of direct fresh water source. The Hydrogen generator, which is an integrated and automated system, would be in a site-ready enclosure. The generation of Hydrogen should be made through caustic free Proton Exchange Membrane (PEM) which is environment*				

Ser	**Programme / Project**	**Expected Life Cycle of Equipment (Yrs)**	**Approx Quantity**	**Amplifying Remarks (If Any)**
friendly and compact. The system should operate under standard electrical conditions and have adequate inbuilt safety features.				
220.	**High Power Computing System INMAC NODPAC**	10	01 system	Navy **POC-PDNOM 011-21410476**
*Broad Parameters/ Preferred Technologies. A high performance computing system (HPCS) with associated equipment, for Indian Naval Meteorological Analysis Center (INMAC) for numerical Prediction to be procured for the operation run of high resolution Numerical Weather Prediction (NWP) Models on 24x7 basis. Should have proven architecture based on high availability to provide sustained high-level of uptime (**99% or more**) and throughput (high sustained G Flops, high I/O bandwidth etc.).*				
221.	**Next Gen Optical Fibre Cable**	20	10,000 KM	Army
Broad Parameters/ Preferred Technologies. It should be ruggedised OFC which would support DWDM based optical domain switching in a TBA with large No of fiber (12/24 Core) having universal ruggedized end connectors for quick layout. It should be easy to maintain in the field.				