

## List of Potential MAKE Projects

### SHQ (ARMY)

Sr no	Proposal
1.	125mm smooth bore gun barrel for T-72 & T-90 tanks with missile firing and improved ammunition
2.	1000HP Engine with associated peripherals for T-72 Tank
3.	Individual Under Water Breathing Apparatus (IUWBA) @ 04 per tank. – for T-90 Tank
4	Environmental Control Unit– for T-90 Tank
5	Auxiliary Power Unit (APU) for T-90 Tank
6	Tracked Light Dozer (TLD)
7	Mechanical Mine Layer (Self Propelled)
8	Mechanical Minefield Marking Equipment (Mk-II)
9	Self-Propelled Mine Burier (SPMB)
10	Assault Track Way- CI 18 for movement of HMVs in Desert & Semi Desert
11	APTA( Advance Pilotless Target Aircraft )
12	MEAT (Manoeuvrable Expendable Aerial Target )
13	Modern Aircraft Refueling Pump

### SHQ (NAVY)

Sr no	Proposal
1.	Diesel engine for Boats
2.	Upper Air sounding system
3.	Supersonic Arial Targets
4.	Targets for Combat torpedo firing
5.	Deck Winches( for shipping applications)
6.	Diesel Engines for Propulsion

### SHQ (Air Force)

Sr no	Proposal
1.	M1 series main & tail rotor blades
2.	Air to Ground Rockets
3.	Chaff & flares
4.	Long Range Glider Bomb

**SHQ(ARMY)**

**Project No.1**

**125MM SMOOTH BORE GUN BARREL FOR T-72 & T-90 TANKS WITH MISSILE FIRING AND IMPROVED AMMUNITION**

1. **Name of Project.** 125MM Smooth Bore Gun barrel for T-72 & T-90 tanks with missile firing and improved ammunition.

2. **Brief.** The current T-72 & T-90 tank barrels are not capable of firing high penetration APFSDS rounds (above 600mm Depth of Penetration(DoP)) due to limitation of safety margin of 600 Mega Pascals (Mpa). There is a requirement to upgrade a common barrel system and ammunition for existing T-72 & T-90 tanks. Development of ammunition to provide capability of penetration and missile firing capability with these barrels also required to be developed together.

3. **Broad Specification.**

(a) **QRs - Barrel/ Gun Articles.**

<b><u>S No</u></b>	<b><u>Parameter</u></b>	<b><u>Capability</u></b>
(i)	Equipment	Barrel (including gun articles) and associated systems.
(ii)	Integration	With T-90 & T-72 tanks with existing Fire Control System (FCS)
(iii)	Capability	To fire ATGM( Anti tank guided missile) through gun barrel and APFSDS ammunition with DoP $\geq$ 600mm RHA.
(iv)	Ammunition	APFSDS, HE(Fragmentation), HEAT & ATGM.

(b) **QRs - Amn (APFSDS).**

<b><u>S No</u></b>	<b><u>Parameter</u></b>	<b><u>Capability</u></b>
(i)	Lethality (DoP)	600 – 800mm of RHA.

(ii)	Effective Rg	3000 mtr
(iii)	Consistency	≤ .35mils
(iv)	Adaptability	Existing FCS & AFVs Sights. Current/ new barrel or Gun Article of T-72 & T-90 tanks. Change in barrel metallurgy & designs (improved).
(v)	Permissible	Alteration auto loader, CLM and BCU/TPU of T-72 & T-90 tanks.

(c) **QRs-Msl.** Existing msl (9M119 – UBK20) to be integrated with the barrel system.

4. **Quantity.** 1000 Nos (minimum).
5. **Time Lines.** Prototype & trial eval by 2019. Production & sup by Dec 2020.
6. **Additional Info.** All future upgrades & improvements may be offered by vendor as part of contractual obligations (incl AMC & life time product support)

**SHQ(ARMY)**

**Project No.2**

**1000HP ENGINE WITH ASSOCIATED PERIPHERALS**

**(FOR TANK T-72 & ITS VARIANTS)**

1. **Name of Project.** 1000HP Engine with associated peripherals for T-72 tanks & its variants.
2. **Brief.** There is a need to upgrade the engine of the T-72 tanks, the power to weight ratio needs to be upgraded from the existing 17hp/ton. There is a need to integrate a newly developed power pack with associated peripherals in T-72.
3. **Broad Specifications.**
  - (a) **QRs.**

<b>Ser No</b>	<b>Parameter</b>	<b>Capability</b>
(i)	Power	1000HP $\pm$ 20HP
(ii)	Power to Wt Ratio	Not less than 20 HP/Ton
(iii)	Fuel consumption	Dunal Trn - 750 km X-Country - 650 km $\pm$ 10 On Rd- 500 km $\pm$ 10
(iv)	Ambient Temp for Ops	All environment condition in sub continent as per JSS/Mil Stds. For eval 40°C to 45°C
(v)	Life of Engine	650 hrs

- (b) **Desirable.** Requisite changes to various sub systems like Cooling, Lubrication, Air Cleaning and Transmission System may be under taken to integrate the high powered engine.
4. **Quantity.** 1000 Nos (minimum).
5. **Time Lines.** Prototype development & trial evaluation by 2018. Production & supply by Dec 2019.
6. **Additional Info.** All future upgrades & improvements may be offered by vendor as part of contractual obligations (incl AMC & life time product support).

**SHQ(ARMY)**

**Project No.3**

**INDIVIDUAL UNDER WATER BREATHING APPARATUS (IUWBA)  
FOR TANK T-90**

1. **Brief Description.** During the course of their, the T-90 tanks are likely to negotiate a variety of terrain features including water obstacles. T-90 tanks have an ability to undergo deep fording at 5 meters depth under water channels of upto 5 knots. During deep fording, in the eventuality of the equipment stalling/ switching off, there is no alternative for the crew to escape from the fighting/driver compartment and reach the surface of the water, before the tank is completely flooded. Towards this end the IUWBA will ensure complete safety of the T-90 tank crew and ensure survivability.

2. **Broad QRs.**

(a) **Physical Chs.**

(i) The IUWBA (sets) should be able to be worn by tank crews during deep fording in the fighting compartment, in a manner that it does not restrain movement of the crew, foul with other moving parts or hinder functioning of the existing components.

(ii) The IUWBA should provide for positive buoyancy to each crew member during the emergency escape procedure which can be activated on demand.

(iii) The IUWBA should be compact enough to be stowed in the under stream crossing equipment (USCE) tool box of the tank when not in use.

(iv) The IUWBA should be separate for each crew member having a breathing inlet in the form of a Face Mask or Oral Respirator for each crew member.

(v) The weight of the IUWBA should not exceed 5 Kg.

(b) **Op and Maint Chs.**

(i) Operate in temperature ranges of +4<sup>0</sup>C to + 45<sup>0</sup> C.

(ii) The equipment should be capable of operating in environment conditions available in the Indian sub-continent and conform to JSS-55555 standards (as applicable to the equipment).

(iii) The equipment should be dust, moisture and leak proof and retain its efficiency when stored at temperature range from -5<sup>0</sup>C to 55<sup>0</sup>C.

(iv) The shelf life of IUWBA should be  $\geq 7$  years.

3. **Tentative quantity to be procured after successful prototype development.** 10,000 Nos.

4. **Tentative Time Line for Induction.** Two to three years.

**SHQ(ARMY)**

**Project No.4**

**ENVIRONMENTAL CONTROL UNIT (ECU) FOR TK T-90**

1. **Brief Description.** The T-90S/SK tank has state of the art features like Computerised Fire Control System, Thermal Imaging Night Sight, missile firing capability, carriage of missiles etc. This equipment is highly sensitive to adverse weather & dust conditions and get degraded under extreme heat and dust. Although, the tank is designed to operate in temperature conditions up to 50<sup>0</sup>C, however, the ambient temperatures in our desert/semi-desert regions rises even beyond that. Resultant to the high temperatures obtaining in the crew compartment the electronic systems/ sub-systems are likely to get degraded. There is thus an imperative requirement of an Environmental Control System for T-90S/SK tanks to avoid detrimental effect to the onboard electronics and opto-electronics.

2. **Broad QRs.**

(a) **Physical Chs.**

(i) **Size and Shape.** The system should be compact and ergonomic **wherein the existing fitment items in the crew compartment should not be removed, however if relocated same should not compromise the operational efficiency of the tank.** The system should not foul with existing features on the tank.

(ii) **Power Supply.** The ECU should be able to operate from the mains, 24V output and also from APU output.

(iii) **Protection.** The system should be protected by **providing a metallic outer casing.**

(iv) **Robustness.** The system should be rugged enough to withstand the hazards of cross country mov in plains and desert terrain.

(v) **Preservation Desired.** The system should comprise sealed units and be water resistant upto tank depth of 1.5 meter while tank is carrying out medium fording operations.

(vi) The system should meet the MIL 461 E standards (as applicable for ground forces) **with regard to EMI/EM compatibility.**

(b) **Tech Parameters.**

(i) AC Type : Split.

(ii) Air Circulation : Closed cycle with air intake from crew Compartment.

(iii) Final inside temperature desired :  $28^{\circ} \pm 5^{\circ} \text{C}$  (hatches closed) in an ambient temperature range from  $-5^{\circ} \text{C} \pm 5^{\circ} \text{C}$  to  $45^{\circ} \text{C} \pm 5^{\circ} \text{C}$ . For temperatures beyond  $45^{\circ} \text{C}$  ambient a minimum of  $15^{\circ} \text{C}$  drop in temperature within the tank must be effected.

(iv) The system should be able to achieve the stipulated final temperature inside temperature within 30 minutes.

(v) Compatibility : As per JSS -5555 (As applicable).

(vi) Relative Humidity of cooled air (%) : 30 to 75.

(vii) The system should have a digital counter to measure the temperature (in oC) and humidity. It should be located at an appropriate place in the crew compartment.

(c) **Op and Maint Characteristics.**

(i) The system should be able to operate efficiently in an ambient temperature range from  $-50^{\circ} \text{C} + 50^{\circ} \text{C}$  to  $45^{\circ} \text{C} + 50^{\circ} \text{C}$ .

(ii) Must be compatible with the main power supply of the AFV with a voltage range from 22V DC to 29V DC (Nominal Voltage 27V DC).

3. **Tentative quantity to be procured after successful prototype development.** 2108 Nos.

4. **Tentative Time Line for Induction.** Two to three years.

**SHQ(ARMY)**

**Project No.5**

**AUXILIARY POWER UNIT (APU) FOR TK T-90**

1. **Brief Description.** The engine of the tank T-90 is the main source of power for any function, however it is imperative to have an alternate source of power to cater for varied requirements to enhance the engine life of a tank. Therefore it is essential to install an APU (Diesel Generator) in the tank T-90, which would preserve the main engines life without compromising on the operational capability of the tank T-90.

2. **Broad QRs.**

(a) **Physical Characteristics.**

(i) **Size and Shape.** The system should be compact and ergonomic wherein the existing fitment items in the crew compartment should not be removed, however if relocated same should not compromise the operational efficiency of the tank. The system should not change the overall dimensions of the tank in vertical and horizontal plane, when viewed from the front. The system should not foul with existing features on the tank.

(ii) **Life.** The APU should be designed to last for minimum 1000 engine hours for which vendor should provide a certificate.

(iii) The system should meet the MIL 461 E standards (as applicable for ground forces) with regard to EMI/EM compatibility.

(iv) **Auxiliary Power Unit (APU).**

(aa) Power Rating : Not less than 10 KW at 27.5  
±1V DC

(ab) Compatibility : As per JSS -55555. (As applicable).

(b) **APU.**

(i) APU should also be able to concurrently operate the following systems of the tank in silent mode (Main engine of the tank switched off) for at least four hours.

(ii) Not foul with ground/trailer while mounting/ dismounting and lashing the tank on a tank transporter and on MBFU/MBWT.

(iii) The APU should be air cooled/water cooled and DHPP 'A' driven. The APU should preferably use 5W 50 grade engine oil or any other oil which is commercially available in India.

(iv) The APU should have an inbuilt overload protection system.

(v) The APU should have a standby starting system apart from the main starting system ie it should be able to be started by external power source, example another APU/tank.

(c) **Op and Maint Characteristics.**

(i) The systems should have a Built-in Test facility to isolate a defect that has occurred in the system..

(ii) The system should provide for a minimum Mean Time Between Overhaul (MTBO) of 1000 hours for APU for which vendor will give a certificate.

3. **Tentative quantity to be procured after successful prototype development.** 2108 Nos.

4. **Tentative Time Line for Induction.** Two to three years.

**SHQ(ARMY)**

**Project No.6**

**TRACKED LIGHT DOZER**

1. **Name of the Project.** Tracked Light Dozer.
2. **Brief of the Project.** Tracked Light Dozer is envisaged as an earth moving plant to be employed by the Indian Army Units in mountainous terrain for a variety of earth moving tasks such as track construction, levelling, land slide clearance & snow clearance etc.
3. **Broad Specifications.**
  - (a) Capable of being lifted by in-service helicopters up to an altitude of 4000m.
  - (b) Detachable Modular Parts of maximum 1.5 to 2 Ton.
  - (c) Capable of being disassembled/ assembled in field with ease, without the need of any specialised equipment.
  - (d) Minimum operating temperature up to (-) 20<sup>0</sup>C.
4. **Tentative Quantity.** The quantity to be procured is approximately 180 with anticipated requirement of 15-20 per year of 10 years with complete spares and overhaul support.
5. **Tentative Timelines for Development/ Production.** Two-three years.

**SHQ(ARMY)**

**Project No.7**

**MECHANICAL MINE LAYER- SELF PROPELLED (MML-SP)**

1. **Name of the Project.** Mechanical Mine Layer- Self Propelled.
2. **Brief of the Project.** Equipment is envisaged to lay anti-tank bar mines and its variants in plains, semi-deserts and desert terrain.
3. **Broad Specifications.**
  - (a) Lay mines by day/ night at following minimum rates:-
    - (i) 250 mines/ hr in plains @ 6 m spacing.
    - (ii) 300 mines/hr in deserts @ 6 m spacing.
  - (b) Fully automatic feeding, conveying, arming and burying of the mines.
  - (c) Option of laying mines at variable spacing between 6 to 12 meters.
  - (d) Automatic date recording with respect to coordinates, self-neutralization and self-destruction periods, on digitised military maps with an accuracy of 10 cms.
  - (e) System to be integrated on in-service High Mobility Vehicles.
  - (f) On board auxiliary powerpack independent of carrier vehicle to run systems of the mine laying equipment.
  - (g) Storage capacity of minimum 335 Qty of mines.
4. **Tentative Quantity.** The quantity to be procured is 239 with complete repair and overhaul support.
5. **Tentative Timelines for Development/Production.** Two-three years.

**SHQ(ARMY)**

**Project No.8**

**MECHANICAL MINEFIELD MARKING EQUIPMENT MK-II (MMME)**

1. **Name of the Project.** Mechanical Minefield Marking Equipment Mk-II.
2. **Brief of the Project.** Equipment is envisaged to mechanically erect perimeter fence for marking minefields in plains, semi-deserts and desert terrain.
3. **Broad Specifications.**
  - (a) Mark minefield @ 1.2 Km/hr with picket to picket spacing of 15 meters.
  - (b) Automatic feeding, dispensing and driving of Long Angle Iron Pickets and rolling out nylon rope to erected Long Angle Iron Pickets.
  - (c) Option of varying picket to picket spacing from 10 meter to 15 meters.
  - (d) **Storage Capacity.**
    - (i) Long angle Iron Pickets - Minimum 500.
    - (ii) Nylon rope - Minimum 12 Kms of 12 mm diameter on Spools.
    - (iii) Other accessories like minefield markers, binding wires.
  - (e) System to be integrated on in-service High Mobility Vehicles.
  - (f) On board auxiliary powerpack independent of carrier vehicle to run the minefield marking systems.
4. **Tentative Quantity.** The quantity to be procured is 230 with complete repair, maintenance and overhaul support.
5. **Tentative Timelines for Development/Production.** Two-three years.

**SHQ(ARMY)**

**Project No.9**

**SELF PROPELLED MINE BURIER**

1. **Name of the Project.** Self Propelled Mine Burier.
2. **Brief of the Project.** Equipment is envisaged to lay anti-tank mines in plains, semi-deserts and deserts terrain.
3. **Broad Specifications.**
  - (a) Lay mines by day / night at following minimum rates:-
    - (i) 250 mines/ hr in plains @ 6 m spacing.
    - (ii) 300 mines/hr in deserts @ 6 m spacing.
  - (b) Fully automatic feeding, conveying, arming and burying of the mines.
  - (c) Option of laying mines at variable spacing between 6 to 12 meters.
  - (d) Automatic data recording with respect to coordinates, self-neutralization and self-destruction periods, on digitised military maps with an accuracy of 10 cms.
4. **Tentative Quantity.** The quantity to be procured is 239 with complete repair and overhaul support.
5. **Tentative Timelines for Development/Production.** Two-three years.

**SHQ(ARMY)**

**Project No.10**

**ASSAULT TRACK WAY CL-24**

1. **Name of the Project.** Assault Track Way Class-24.
2. **Brief of the Project.** The Assault Track Way Class-24 is envisaged as a light weight track material to be employed in Desert/ Semi Desert terrain for mobility of wheeled vehicles of the Indian Army with load class up to Class-24. It is proposed to replace the existing Aluminium Alloy based Assault Track Way Class-12.
3. **Broad Specifications.**
  - (a) Temp tolerance up to +50<sup>0</sup>C.
  - (b) The surface finish should be able to blend with the terrain without any shiny surfaces.
  - (c) It should facilitate ease of laying and recovery with manual effort as well as mechanical aids.
  - (d) The expected life of the track material should be 10,000 passes of Class-24 vehicles.
  - (e) Weight of one roll of track material should not exceed 300 kgs.
4. **Tentative Quantity.** The total requirement will be approximately 1000 km and the annual requirement will be 20-50 km per year.
5. **Tentative Timelines for Development/Production.** Two-three years.

**SHQ(ARMY)**

**Project No.11**

**ADVANCED PILOTLESS TARGET AIRCRAFT (APTA)**

1. **Brief Description.** Army AD has a variety of weapon platforms to include missiles of varying ranges and Gun Systems. There is a recurring regiment of suitable aerial target systems for providing realistic training to the crews during the annual field firing exercises.

2. **Broad QRs.**

<b><u>SN</u></b>	<b><u>Parameter</u></b>	<b><u>Capability</u></b>
(a)	Max Speed	Not less than 0.6 Mach (550 m/s) speed at 6000m altitude in clean configuration (ie without tow body)
(b)	Max Endurance	Not less than 45 mins at 4000 m alt at 0.40M with one tgt towed
(c)	Min Altitude	Not less than 300m for clean configuration
(d)	Max Altitude	Not less than 8km for clean configuration
(e)	Manoeuvrability	Not less than 3.5 'g'
(f)	Launch Mode	By ground/sea
(g)	Radar Band for Detection	X, Ku and Ka Bands
(h)	Range	Radio control up to 60 Kms or more and Autonomous mode up to 100 Kms
(j)	Recovery	Ground based

3. **Tentative Quantity.** Approx 05 per year.

4. **Tentative Timelines for Development/Production.** Two-three years.

**SHQ(ARMY)**

**Project No.12**

**MANOEUVRABLE EXPENDABLE AERIAL TARGET (MEAT)**

1. **Brief Description.** Army AD has a variety of weapon platforms to include missiles of varying ranges and Gun Systems. There is a recurring reqmt of suitable aerial target systems for providing realistic training to the crews during the annual field firing exercises.

2. **Broad QRs.**

<b><u>Ser No</u></b>	<b><u>Parameter</u></b>	<b><u>Capability</u></b>
(a)	Max Speed	Not less than 400 Kmph or more (111 m/s).
(b)	Max Endurance	Not less than 30 minutes or more at Wide Open Throttle (WTOT) at sea level.
(c)	Min Altitude	Not less than 20m or less.
(d)	Max Altitude	Not less than 5000m or more.
(e)	Manoeuvrability	Not less than 2.0 'g' or more in a sustained turn.
(f)	Launch Mode	Ground based.
(g)	Range	X, Ku and Ka Bands
(h)	Employability	Radio Control up to 75 Km or more.
(j)	Likely utilisation per year	Not less than 400 Kmph or more (111 m/s).

3. **Tentative Quantity.** Approx 50 per year.

4. **Tentative Timelines for Development/Production.** Two-three years.

**SHQ(ARMY)**

**Project No.13**

**MODERN AIR CRAFT REFUELLING PUMP (MARP)**

1. **Brief Description.** Modern Air Craft Refuelling Pump needs to be designed to supply fuel, without anti-icing additives to aircrafts from ground tanks/ containers. It would be mainly required at forward avn bases.

2. **Broad QRs.**

<b><u>S No</u></b>	<b><u>Parameter</u></b>	<b><u>Capability</u></b>
(a)	Normal flow rate	130-150 litre per minute
(b)	Suction head	6 ± 2 mtrs
(c)	Delivery head	3 ± 0.5 mtrs
(d)	Length of the suction hose	+ 15 mtrs
(e)	Operating temp range	-10 <sup>0</sup> to 43 <sup>0</sup> C
(f)	Operating altitude	Upto 4000 mtrs
(g)	Internal Combustion engine	Petrol engine
(h)	Engine Type	4 Stroke, air cooled, min net HP 1.3 hp or one Kilo Watt at 7000 rpm and compliance of the engine SAE-J-1349.
(j)	Fuel	Petrol
(k)	Operability	Function continuously for 1 to 1.5 hours with corresponding fuel tank capacity.
(l)	Starting System	Engine will be battery operated with the facility of manual cranking.
(m)	Water Separation	As per Civil Aviation norms
(n)	Power supply	12 volts.
(o)	Length of delivery pipe	Min 15 mtrs.
(p)	Bonding reel drum for hoses	
(q)	Vane type displacement pump	
(r)	Absorber filters with clogging indicator window, filter drain valve and hose.	

3. **Tentative Quantity.** 434.

4. **Tentative Timelines for Development/Production.** Two-three years.

**SHQ (NAVY)**

**Project No.1**

1.	<b>Name of Potential Project</b>
	Diesel engines for boats
2.	<b>BRIEF SPECS</b>
	<ul style="list-style-type: none"><li>▪ For propulsion of various boats used in <b>IN</b></li><li>▪ The engine is to be supplied with its associated ancillary equipment, pipes, fittings, instrumentation which broadly include the following:-<ul style="list-style-type: none"><li>• All piping and fittings forming integral parts of the engine like flywheel, governor, lub oil and fw cooler, engine driven fresh water pump, lub oil pump, sea water pump, hand operated sump drain pump, filters (air, lub oil and fuel oil).</li><li>• 24 V electric starting equipment along with suitable battery catering to minimum 40 starts of the engine with provision for alternative mechanical / hand start</li><li>• Exhaust system comprising silencer, manifold (water cooled type)</li><li>• Engine driven fresh water, fuel oil and lube oil pumps</li><li>• Instrumentation consisting of ammeter, push button for starting, lo pressure gauge, Low temperature gauge, engine cooling water temp gauge, tachometer with drive, hour meter, gearbox oil temp gauge. The instrumentation panel should be water proof.</li><li>• The engine should be fresh water cooled which in turn should be cooled by sea water.</li></ul></li></ul>
3.	<b>Tentative quantity to be procured after successful prototype development</b>
	<ul style="list-style-type: none"><li>▪ Approx 40 for 2016-17</li></ul>
4.	<b>Tentative timeline for induction</b>
	03 to 05 years

**SHQ (NAVY)**

**Project No.2**

1.	<b>Name of Potential Project</b>
	Upper Air Sounding System (UASS)
2.	<b>Brief Specs:</b>
	To Record:- <ul style="list-style-type: none"><li>▪ Upper Air Profile for Weather Prediction</li><li>▪ Generation of Aviation Met Reports</li><li>▪ Assessment of Anomalous Propagation Conditions</li><li>▪ Ballistic Correction for Ammunition Firing</li></ul> <p><i>Complete system is Integral Part of all Capital Ships, Aircraft Carriers And Air Stations</i></p>
3.	<b>Tentative Quantity to be Procured After Successful Prototype Development</b>
	Ground Station (Fixed) : 25 Units For <b>IN</b>  Radiosonde (Consumable) : Approx 14000 Per Annum
4.	<b>Tentative Timeline for Induction</b>
	24 Months

**SHQ (NAVY)**

**Project No.3**

1.	<b>Name of Potential Project</b>
	Supersonic Aerial Targets (Mss Cluster)
2.	<b>Brief Specs:</b>
	<ul style="list-style-type: none"><li>▪ Speed greater than 1 mach at less than 20 m</li><li>▪ Min Altitude 5-20m &amp; max greater than or equal to 1000m</li><li>▪ Range 50 km or more</li></ul>
3.	<b>Tentative Quantity to be Procured After Successful Prototype Development</b>
	<ul style="list-style-type: none"><li>▪ Initial order likely to be <math>\approx</math> 10</li></ul>
4.	<b>Tentative Timeline for Induction</b>
	04 years

**SHQ (NAVY)**

**Project No.4**

1.	<b>Name of Potential Project</b>
	Targets for Combat Torpedo Firing
2.	<b>Brief Specs:</b>
	Underwater Expendable Target For Combat Torpedo. Broad Requirement:- <ul style="list-style-type: none"><li>▪ Easy To Lay/Recover And Transportable By Ship</li><li>▪ Target Autonomous Once Laid</li><li>▪ Capable Of Seducing Active &amp; Passive Homing Light/Heavy Weight Torpedo</li></ul>
3.	<b>Tentative Quantity to be Procured After Successful Prototype Development</b>
	<ul style="list-style-type: none"><li>▪ One/ two per year</li></ul>
4.	<b>Tentative Timeline for Induction</b>
	04 years

**SHQ (NAVY)**

**Project No.5**

<b>1.</b>	<b>Name of Potential Project</b>
	Winches - Deep Sea Side Scan Sonar Towing Winch
<b>2.</b>	<b>BRIEF SPECS</b>
	<ul style="list-style-type: none"><li>▪ A self-contained, electro-hydraulic or electro-mechanical, variable speed cable handling system.</li><li>▪ Stainless steel hardware protected for marine environment.</li><li>▪ Capable of withstanding load on the winch in sea state 3-4 at ship speed of 10 knots.</li><li>▪ Size – not more than 5 ft w x 4 ft h x 4ft l</li><li>▪ Total weight – less than 1500 kg</li><li>▪ Automatically align cable during retraction to avoid fouling of cable.</li><li>▪ Remote control operation in addition to local control and manual.</li><li>▪ Suitable electrical motor capable of operating on ship's power supply 415 v/ 3 phase/ 50 hz.</li><li>▪ The drum should leave atleast 2" in clearance on flange</li></ul>
<b>3.</b>	<b>Tentative quantity to be procured after successful prototype development</b>
	<ul style="list-style-type: none"><li>▪ Qty – 04 Nos</li></ul>
<b>4.</b>	<b>Tentative timeline for induction</b>
	02 years

**SHQ (NAVY)**

**Project No.6**

<b>1.</b>	<b>Name of Potential Project</b>
	Diesel Engines For Propulsion
<b>2.</b>	<b>BRIEF SPECS</b>
	<ul style="list-style-type: none"><li>▪ The Diesel Engines are required for propulsion onboard Ships. The Engines with Power Rating of 5-10 MW are required to be indigenously developed.</li> <li>▪ The maximum speed of the ship would be required to be achieved at 85% MCR of the Engine. The Engines are to be capable of 10% overload for a minimum duration of one hour in 12 hours at extreme tropical conditions without incurring any undue wear, maintenance and risk of damage.</li> <li>▪ The Engine is to be supplied with its associated Ancillary Equipment, Pipes, Fittings, Instrumentation etc.</li> <li>▪ The materials used in the engine should comply to Defstan 02-313. The broad specifications will be provided on request.</li> <li>▪ The Engines should be class approved and certified by IRs/ABs or any other suitable agency. The first of the Engine will be type tested.</li> <li>▪ The Engine emission should meet the latest Nitrogen Oxides (NOX) and Particulate Matter (PM) standards as promulgated by IMO for new Diesel Engines. The Diesel Engine will as a minimum comply with IMO Tier II emission norms.</li></ul>
<b>3.</b>	<b>Tentative quantity to be procured after successful prototype development</b>
	<ul style="list-style-type: none"><li>▪ The Quantities would be finalised post discussions and based on Induction Plan of Ships for 5-10 MW Power Rating Engines.</li> <li>▪ Tentative Quantities are 15 Per Year 2020 onwards</li></ul>
<b>4.</b>	<b>Tentative timeline for induction</b>
	03 To 05 Years

## SHQ (Air Force)

### Project No.1

<b>1.</b>	<b>Name of Potential Project</b>												
	Manufacture & Repair of Main Rotor Blades (MRB) & Tail Rotor Blades (TRB) of Mi-series Helicopters												
<b>2.</b>	<b>Brief about the project</b>												
	IAF has more than 250 Mi Series helicopters and the number is likely to increase. Each helicopter has five MRBs and three TRBs. The MRB/TRB are fixed components and thus are required to be replaced on life expiry. The MRBs/TRBs are also required to be repaired on damage/defect. Hence IAF intends to develop and productionise these blades.												
<b>3.</b>	<b>Broad specifications / PSQRs which can be shared with the Industry</b>												
	<ol style="list-style-type: none"><li>1. Life of MRB is 2000 operational hrs and life of TRB is 1000-1400 operational hrs.</li><li>2. MRB/TRB are made of a metal spar with honey comb sections/ boxes to provide the aerofile shape. The blades also have electrical strips for Anti-icing. Board specifications of MRB/TRB are as follows:-</li></ol>												
	<table border="1" style="margin-left: 40px;"><thead><tr><th></th><th style="text-align: center;"><b>MRB</b></th><th style="text-align: center;"><b>TRB</b></th></tr></thead><tbody><tr><td style="text-align: center;">Length</td><td style="text-align: center;">9.77 Mtr</td><td style="text-align: center;">1.179 Mtr</td></tr><tr><td style="text-align: center;">Weight</td><td style="text-align: center;">135 kg</td><td style="text-align: center;">13.85 kg</td></tr><tr><td style="text-align: center;">Chord</td><td style="text-align: center;">520 mm</td><td style="text-align: center;">305 mm</td></tr></tbody></table>		<b>MRB</b>	<b>TRB</b>	Length	9.77 Mtr	1.179 Mtr	Weight	135 kg	13.85 kg	Chord	520 mm	305 mm
	<b>MRB</b>	<b>TRB</b>											
Length	9.77 Mtr	1.179 Mtr											
Weight	135 kg	13.85 kg											
Chord	520 mm	305 mm											
<b>4.</b>	<b>Tentative quantity to be procured after successful prototype development</b>												
	30 to 35 sets of MRBS/TRBs each, per year												
<b>5.</b>	<b>Tentative timeline for induction</b>												
	2019 onwards over the next 25 years												
<b>6.</b>	<b>Any other relevant information</b>												
	<ol style="list-style-type: none"><li>(a) Indian Vendor has to obtain ToT and certification from the Russian OEM for indigenous manufacture and repair of MRB and TRB under license.</li><li>(b) Manufacture and Repair of MRB/TRB for other helicopters such as CTK/CTH and ALH may also be explored.</li></ol>												

**SHQ (Air Force)**

**Project No.2**

1.	<b>Name of Potential Project</b>
	Air to Ground Rockets — 70 mm Calibre
2.	<b>Brief about the project</b>
	MoD, Gol intends to procure Air to Ground rockets for large number of delivery platforms. The rockets are proposed to be developed and manufactured under the 'Make' category of the DPP. As a preliminary step, Air to Ground Rockets of 70 mm Calibre are intended to be indigenously developed and produced.
3.	<b>Broad specifications / PSQRs which can be shared with the Industry</b>
	(a) 70 mm rockets must be compatible and capable of being fired successfully without any deterioration in parameters. (b) Types of warhead - HE, AP, AP-T, TP, TP-T etc. (c) High dispersal accuracy. (d) High shelf life (e) Operation, Transportation and storage in Indian conditions.
4.	<b>Tentative quantity to be procured after successful prototype development</b>
	(a) Immediate requirement: Around 30,000. (b) Recurring requirement: Around 20,000 per year.
5.	<b>Tentative timeline for induction</b>
	2018-21
6.	<b>Any other relevant information</b>
	(a) A detailed RFI on the subject would be issued shortly. (b) On successful development of such capability, other similar weapons are also intended to be indigenised.

**SHQ (Air Force)**

**Project No.3**

1.	<b>Name of Potential Project</b>
	Chaff & Flares
2.	<b>Brief about the project</b>
	Chaff is a form of volumetric radar reflecting material that is composed of distributed metalized radar reflecting reflector material. Flares are T designed to be effective against infrared (IR Seeking missile). Presently Chaffs and Flares are being imported for use on various fighter, transport & helicopter fleet of IAF. These are proposed to be developed and manufactured under the 'Make' category of the DPP.
3.	<b>Broad specifications / PSQRs which can be shared with the Industry</b>
	(a) Chaffs intended to be developed are under three sizes viz 26mm, 50mm & 1"X1 "X8". (b) Flares are to be developed under three sizes viz 26mm, 50mm & 2"x1"x8"
4.	<b>Tentative quantity to be procured after successful prototype development</b>
	Around One lakh Chaffs and Two Lakh Flares per year
5.	<b>Tentative timeline for induction</b>
	Recurring requirement from year 2019 onwards

**SHQ (Air Force)**

**Project No.4**

1.	<b>Name of Potential Project</b>
	Long Range Glide Bombs
2.	<b>Brief about the project</b>
	MoD, Gol intends to procure Long Range Glide Bombs (LRGBs) to be delivered from different aircraft platforms. The LRGBs are proposed to be developed and manufactured under the 'Make' category of the DPP. As a preliminary step, two classes of LRGBs_viz 125 Kg and 500 Kg, compatible with Su-30 MKI aircraft are intended to be indigenously developed and produced.
3.	<b>Broad specifications / PSQRs which can be shared with the Industry</b>
	(a) Mai Range should be around 100 km when released from 42000 ft. (b) Types of warhead - Blast fragmentation and Penetration. (c) High accuracy. (d) High shelf life (e) Operation, Transportation and storage in Indian conditions.
4.	<b>Tentative quantity to be procured after successful prototype development</b>
	Appr a thousand per year.
5.	<b>Tentative timeline for induction</b>
	As soon as trials are successfully completed.

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