FUTURE READY COMBAT VEHICLE (FRCV)

BRIEF OF PROJECT

1. **Name of the Proposal**. Procurement of Future Ready Combat Vehicle (FRCV) for Indian Army.

2. **User Directorate in SHQ**. Directorate General of Armoured Corps (AC-4).

3. **Introduction**. Further to the RFI uploaded on the MoD Website in **June 2021**. The Project for Procurement of FRCV has now been accorded '**Approval in Principle**' to be progressed under the **Make-I** Category.

4. **Brief Description**. FRCV with capability to act as a multiple weapon platform along with infusion of niche technology will cater for the future capability requirements and enhance overall operational effectiveness index of the Indian Army (IA) by catering for emerging threats in varied terrain. FRCV will offer multiple options for rapid operational employment enabling the Indian Army to execute operations across the entire continuum of conflict against diverse threat and equipment profile of the adversaries. The FRCV would be in-service for the next 35-45 years and therefore should be designed to deliver the highest lethality survivability and agility on the battlefield combined with a fully digitised data backbone architecture to enable Next-generation operational capabilities and automation.

5. **Proposal**. A main battle tank is a system of systems and is a fusion of apex technologies existing in the realm of land systems. The project for FRCV will provide a unique opportunity to the Indigenous Defence Industry to come together and realise an '*Indigenously Designed and Developed in India*' battle system as a national effort. It will enable India to join the league of select nations possessing this capability. It will also help to build research and manufacturing capabilities to foster technological spinoffs benefitting a host of civil/ dual use applications. The Ministry of Defence, GoI, intends to procure quantity 590 FRCV in the first phase.

6. **Broad Technical Parameters**. The broad technical parameters are as given below. The same would be further elaborated in the Project Definition Document (PDD).

Specification	**Parameters**
(a) **Basic Configuration**	(i) Combat Weight not to exceed 55±5% Tons. (ii) Transportable by in service aircraft, ships, rail and road infrastructure. (iii) Crew – four (04).
(b) **Fire Power & Lethality**	(i) **Main Gun**. Minimum 120mm and above calibre. Capable of firing the following ammunition an engagement of targets in static and dynamic mode by day and night:- (aa) Armour Piercing Fin Stabilised Discarding Sabot (APFSDS) – minimum range 2500 meters. (ab) High explosive Anti-Tank (HEAT) – minimum range 1600 meters. (ac) High explosive (HE) – minimum range of 5000 meters in direct and 10000 meters in indirect role.

Specification	**Parameters**
	(ad) Missile (anti-tank & anti-helicopter) - minimum effective range from 500 meters to 5000 meters. (ii) **Elevation Depression**. Elevation minimum 20° and Depression minimum 8°. (iii) **Traverse Angle**. Main gun & turret should be 360^0 traversable. (v) **Secondary Armament**. (aa) **Coaxial Machine Gun**. 7.62mm with minimum range ≥ 1800 meters. (ab) **Anti-Aircraft Machine Gun (AAMG)**. 12.7mm in-service or improved with Remotely controlled weapon system (RCWS). Effective range of minimum 1500 meters (aerial targets) and minimum 2000 meters (ground targets). (vi) **Fire Control System (FCS)**. All weapons connected with targeting sights and the fire control computer through the fully digitised architecture, seamless target engagements and capability to incorporate **AI decision support** with following features:- (aa) **Hunter-Killer Mode**. Multiple Target Tracker with capability for tank commander to search and queue up targets for auto designation to Gunner. Lock on launch and automatic laying of gunner's sight on next target, once first engagement is successfully concluded. (ab) **Killer-Killer Mode**. The Tank Commander and Combat Operator should also have the capability to engage targets in addition to the Gunner with the main gun and also with the secondary weapons / LM in case the Gunner is engaged in operating the main gun. (ac) **Automatic Target Detection & Tracking System (ATDTS)**. ATDTS with suitable sensors capable of a "lock-on" mode, which can acquire & track specific targets. (ad) Integration with **Battlefield Management System (BMS)** & **Identification of Friend and Foe (IFF)** to generate Common Fire Control Picture (FCP).

Specification	**Parameters**
(c) **Survivability**	(i) **Active Protection System (APS)**. (aa) 360^0 all-round protection with a dedicated **Top-Attack Protection System** (ab) Soft kill systems (detection & disruption against hostile element's laser designation, ranging, missile launch, missile homing etc). (ac) Hard Kill systems (to destroy/ deflect incoming projectiles). (ii) **Passive Protection**. (aa) Protection equivalent to minimum 800mm RHA in frontal 60º Arc and minimum 600mm equivalent RHA with suitable light weight solutions for all round protection. (ab) Protection at Belly of tank to survive Improvised Explosive Device (IED) & mine blasts of minimum 15 kgs of TNT. (ac) Protection against top attack munitions equivalent to protection with minimum 600mm RHA by suitable light weight solution without compromising the silhouette. (ad) Capable of incorporating modular armour including Explosive Reactive Armour (ERA)/ Non Explosive Reactive Armour NERA which could be scalable. (ae) Provision to mount separate modular attachment for clearing path for moving across minefields. (af) Crew Compartments must be fitted with spall liners or alternate solutions to protect crew. (iii) **Instant Fire Detection & Suppression System**. Automated activation response and fire detection of not more than 20 milliseconds. The fire should be suppressed within 130 milliseconds in crew compartment and 10 seconds in engine compartments. (iv) **Missile Warning System**. Pre- Shot detection capability with LASER Warning System and Directional smoke dispenser or any other solution as Counter Measure. (v) **Stealth & Signature Management**. Suppress various signatures viz Acoustic, Visual, Infra-red, Thermal and Electromagnetic (EM) Signatures by 50% in the range of observation. (vi) **Chemical, Biological, Radiological& Nuclear (CBRN) Protection**. Protection against effects of Nuclear explosions, Electromagnetic Pulse (EMP) attacks, Toxic Chemical Agents and Biological Warfare agents and be able to operate effectively in a CBRN environment and incorporate a CBRN warning system.

Specification	**Parameters**
(d) **Mobility**	(i) **Power Pack**. Minimum 1500 HP engine with a minimum life of 750 engine hours without overhaul. De-rating facility to cater for High Altitude Area operations. (ii) **P/W Ratio**. Not less than 27:1 HP/Ton. (iii) **Nominal Ground Pressure (NGP)**. Not exceeding 0.90 Kg/Cm^2. (iv) **Operational Range**. Not less than 400 Km in cross country/ desert terrain and 500 Km on road. (v) **Fording Capability**. Minimum 5 meters depth. (vi) **Transmission System**. Automatic or Continuous Variable Transmission with mechanical redundancy. (vii) **Suspension**. Rugged suspension to provide a stable platform and smooth drive for cross country. (viii) **Tacks**. Quick fit and detachable Rubberised Pads/ Composite Tracks. (ix) **Batteries**. Latest technology rechargeable batteries for starting of Engine and powering sub-systems.
(e) **Communication**	(i) Software Defined Radio. (ii) Hands free internal communication for crew. (iii) Network enabled for supporting additional feeds from in-service Unmanned Aerial Vehicle (UAV), Drone swarms and other elements like attack helicopters & aircrafts. (iv) Digital Inter-Crew Communication System for all the crew members, independent of the radio sets utilizing common hands free head gear assemblies. (v) Compatibility with existing systems such as Global Positioning System (GPS), Advanced Land Navigation System (ALNS), HF (High Frequency) Radio set, Alarm Integration and Data transfer ability etc. (vi) Tactical Wifi Network System within an area of 10 Sq Km capable of transmitting high speed data and situational awareness picture.
(f) **Situational Awareness**	Defence Series Map (DSM) compatible Hybrid navigation system retaining the capability for incorporating Satellite [Indian Regional Navigation Satellite System (IRNSS)] and Inertial navigation.
(g) **Niche Capabilities**	(i) Fully digitised system capable of **Human-Machine Teaming** and control of Unmanned Ground Vehicles (UGVs), UAVs, on-board or off-board drones, LMs & capability to operate Tethered Drone.

Specification	**Parameters**
	(ii) Integrated **Battle field Management System (BMS)** and **Identification of Friend or Foe (IFF**) by achieving integration of all sensors, weapons and communications. (iii) **360° Vision** coverage as well as input, akin to concept of **see through armour**, to the Command, Control, Communications, Computers and Information (C4I) system. (iv) **Cyber Warfare** hardened and capability to operate in a contested Electromagnetic (EM) spectrum and intense **Electronic Warfare** (EW) environment. (v) **BLOS Strike Capability**. Employ LMs (Loiter Munitions) in conjunction with surveillance drones (compatible with in-service surveillance drones with suitable human interface) as a system from the platform.
(j) **Other Capabilities**	(i) **Vetronics**. Condition Based Monitoring System to display health of the platform. (ii) **Modularity**. Basic configuration preferred to be modular allowing attachment/ detachment and reconfiguration of components for repair and maintenance in order to provide greater flexibility in operational role. (iii) **Auxiliary Power Unit (APU)**. APU capable of running all sub sys of tank for minimum six hours at a time. (iv) **Cold Start Capability**. Suitable Cold Start capability for the main engine and the APU engine at specified minimum temperature ranges/ environment conditions. (v) **Ammunition Loading & Stowage**. Ammunition should be auto- loaded with minimum 16 rounds ready for auto loading along with provision for Semi-Automatic and Manual Loading. All ammunition should be stored in easily accessible containerised compartments (Bustle Loader), with suitable safety measures like Blow-Off Panels. (vi) **Gun Control System**. All-Electric-Drive System in both horizontal and vertical planes, with backup manual operation for both traversing and elevating mechanisms. (vii) Environment Control Unit.

7. **Indigenous Content (IC) / Categorisation**. Successful development under **Make-I** would result in acquisition, from successful Development Agency (DA), through the '**Buy (Indian-IDDM)**' category with indigenous design and Development and a **minimum of 50% IC**.

8. The questionnaire to seek industry response for carrying out feasibility study for project FRCV is enclosed as Appendix. Interested entities may respond by 31 May 2023 positively.

9. **Disclaimer**. This project brief is neither an agreement and nor an offer by the MoD to the prospective bidders or any other person. The purpose of this project brief is to provide interested parties with information that may be useful to them in submitting their proposals pursuant to this project brief. The questionnaire has been prepared to obtain information for the feasibility study to assess the status of enabling technologies and capabilities of the Indian industry. This project brief includes statements, which reflect various assumptions and assessments arrived at by the MoD in relation to the project. This project brief, questionnaire and any assumptions, assessments and statements made herein do not purport to contain all the information that each responding entity may require. The responding entity shall bear all its costs associated with or relating to the preparation and submission of proposal pursuant to this project brief and the questionnaire. Wherever necessary, MoD reserves the right to amend or supplement the information, assessment or assumptions contained in this project brief and the questionnaire. The MoD reserves the right to withdraw the project brief and the questionnaire or foreclose the procurement case at any stage. The issuance of this project brief and the questionnaire does not imply that the MoD is bound to shortlist a responding entity for the Project. The MoD also reserves the right to disqualify any responding entity should it be so necessary at any stage on grounds of National Security.

10. **Contact Details**.

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