

REQUEST FOR INFORMATION FOR
FUTURISTIC INFANTRY COMBAT VEHICLE (TRACKED)

Reference:- Defence Acquisition Procedure-2020 (DAP-2020)

Appendices:-

Appendix A - Technical Parameters for FICV(Tracked)

Appendix B - Questionnaire/ Response Form

Appendix C - Information Sought from Vendors

Appendix D - Guidelines for Vendor Selection /Pre-qualification

1. The Ministry of Defence, Government of India, intends to procure an approximate **1750** quantities of Futuristic Infantry Combat Vehicles (Tracked) [**FICV(Tr)**] in following three versions (details of versions are given in **Appendix A** Paragraph 4):-

- (a) **FICV(Tr) Gun Version**: Approximately 55% of total quantity.
- (b) **FICV(Tr) Command Version**: Approximately 20% of total quantity.
- (c) **FICV(Tr) Command & Surveillance Version**: Approximately 25% of total quantity.

2. This Request for Information (RFI) is being issued with a view to finalise SQRs, decide procurement category and identify probable Indian vendors who are capable to commence supply of FICV(Tr) **within two years** of Award of Contract / Supply Order @ at least 75-100 Fully Formed vehicles per year.

3. FICV(Tr) is planned to be procured in the spirit of 'Make in India' and 'Atmanirbhar Bharat' programs. The preferred categorisation for the project as per provisions of Chapter-II of DAP-2020 may be indicated by the vendor with due justifications.

4. This RFI consists of three parts as indicated below: -

- (a) **Part-I**. The first part of the RFI incorporates operational characteristics and features that should be met by the FICV(Tr). Few important technical parameters desired have also been mentioned.
- (b) **Part-II**. The second part of the RFI states the methodology of seeking response of vendors.
- (c) **Part-III**. Guidelines for vendor selection / pre selection.

PART- I

Intended Use of the Equipment

5. **Terrain Conditions**. FICV(Tr) will be employed for cross country (off road) operations including amphibious operations in under mentioned terrain conditions: -

- (a) Plain and desert terrain as occurring along Western Borders of India.
- (b) High Altitude (up to 5000 meters altitude) / Mountain terrain as occurring along Northern Borders (Eastern Ladakh/ Central Sector / North Sikkim) of India.

6. **Weather Conditions**. FICV(Tr) should be operational by day & night and in commonly encountered weather conditions including dust in the above terrains.

7. **Temperature Conditions.** The FICV(Tr) including all sub-systems should be operational in following ambient temperature conditions: -

(a) **Plain and Desert Terrain.**

(i) Minimum Operating Temperature: Between 0° to 05° Celsius.

(ii) Maximum Operating Temperature: Between 40° to 45° Celsius.

(b) **High Altitude & Mountain Terrain.**

(i) Minimum Operating Temperature: Between (-)20° to (-)10° Celsius.

(ii) Maximum Operating Temperature: 40° Celsius.

8. **Operational Requirements.** The FICV(Tr) will be employed in above mentioned terrain and environmental conditions. The following main operational tasks will have to performed by FICV(Tr):-

(a) Destroy enemy tanks, Armoured Personnel Carriers, combat vehicles, low flying helicopters and other ground based weapon platforms / positions.

(b) Protected mobility to its crew and troops (sticks) in the above mentioned terrain and in CBRN environment including across water bodies.

(c) Provide fire support to dismounted sticks.

Important Technical Parameters

9. **Design Concept.** The FICV(Tr) should be modular in design, thereby lending itself to future upgrades through simple modifications and to facilitate subsequent development of family of Armoured Fighting Vehicles (AFVs) like Command-Control ICV, Armoured Personnel Carrier (APC), Armoured Ambulance, Mortar Carrier, Command Post Vehicle, Reconnaissance & Surveillance Vehicle, NBC Reconnaissance Vehicle, Engineer Reconnaissance Vehicle, Armoured Recovery Vehicle etc.

10. **Important Technical Parameters.** The preferred technical parameters for FICV(Tr) are given at **Appendix 'A'** to this RFI.

11. **Three-Stage Induction Model.** Given the complex nature of AFV Design & Development and requirement to integrate several major systems in the FICV(Tr) and technological changes over next 18-20 years (induction schedule @75-100 per year), it is essential that FICV(Tr) is supplied in the following three stages: -

(a) **Stage-I: Limited Series Production (LSP).** Approximately 10% of the total quantity as LSP over two years @ 75-100 Fully Formed FICV(Tr) per year.

(b) **Stage-II: Product Improvement.** Approximately 40% of the total quantity over next six to seven yrs @100 FICV(Tr) per year. These quantities would have to incorporate product improvement aspects learnt from exploitation of the LSP model.

(c) **Stage-III: First Upgrade.** The final order would include the balance quantities with technical upgrades, besides product improvement aspects from Stage-II product.

General Provisions

12. Vendors should confirm that the following conditions are acceptable: -

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

(b) The technical offers would be evaluated by a Technical Evaluation Committee (TEC) to check its compliance with RFP.

- (c) The equipment of all TEC cleared vendors would be put through a trial evaluation at suitable locations in India nominated by the buyer on a “**No Cost No Commitment**” basis. A staff (GS) evaluation would be carried out by Army HQ to analyse the result of field evaluation and to short-list the equipment for introduction into service.
- (d) Amongst the vendors cleared by GS evaluation, a Contract Negotiations Committee would decide the lowest cost bidder (L1) and conclude the appropriate contract.
- (e) Vendor would be bound to provide product support for time period specified in the RFP, which includes spares and maintenance tools/jigs/fixtures for field and component level repairs.
- (f) The vendor would be required to accept the general conditions of contract given in the Standard Contract Document at Chapter-VI of DAP-2020.
- (g) **Offset (if applicable)**. If applicable, the vendor has to undertake “Defence Offsets” as per provisions given in the DAP-2020 (refer Appendix ‘D’ to Chapter-II of DAP-2020).
- (h) **Integrity Pact**. An integrity pact along with appropriate IPBG is a mandatory requirement in the instant case (refer Annexure-I to Appendix M of Schedule-I of DAP).
- (i) **Performance-cum-Warranty Bond**. Performance-cum-Warranty Bond both equal to 5% value of the contract (inclusive of taxes and duties or as amended from time to time) is required to be submitted after signing of contract.
- (j) **ToT (if applicable)**. Government of India is desirous of license production of FICV(Tr) after acquiring ToT in the Case.

PART – II

13. **Procedure for Response.**

- (a) Interested vendors must fill **Response Form** attached at **Appendix ‘B’** to this RFI (**additional technical literature** on your product can also be attached with the form).
- (b) Interested Vendors must forward information as per **Vendor Information Proforma** attached at **Appendix ‘C’** (refer Annexure II to Appendix ‘A’ to Chapter II of DAP-2020).
- (c) Interested vendors are required to intimate their **willingness to participate** in the project **within 07 days** from the date of hosting of the RFI by submitting the Vendor Information Proforma through email/ by hand to under mentioned address: -
ADG MECH INF
 MECH-8 Section, General Staff Branch
 Room Number 525, A-Wing Sena Bhawan, Army HQ,
 DHQ PO, New Delhi-110011
 Email: AMIMAT.03315@GOV.IN
- (d) Date, time and location for **Pre-Response Vendor Interaction** will be intimated to only those companies who intimate their willingness to participate.
- (e) **One set** of response to this RFI (Response Form) along with Vendor Information Proforma should be submitted in **hard form** and **soft form (CDs)** to the following Directorates: -
- (i) **ADG MECH INF**
 MECH-8 Section, General Staff Branch
 Room Number 525, A-Wing Sena Bhawan, Army HQ,
 DHQ PO, New Delhi-110011; Email: AMIMAT.03315@GOV.IN
- (ii) **ADG Acquisition Technical (Army)**
 Acquisition Wing, Ministry of Defence,
 Room No 30, D-2 Wing Ground Floor, Sena Bhawan,
 New Delhi-110011
 Tele : 011-23011202, e-mail : TMLS-MOD@NIC.IN

- (iii) **DG CD**
 CD-15B Section, General Staff Branch
 Room Number 527B, A-Wing Sena Bhawan, Army HQ,
 DHQ PO, New Delhi-110011
- (iv) **ADG ADB**
 AC & MECH INF Section, General Staff Branch
 Room Number 16, C-Wing Sena Bhawan, Army HQ,
 DHQ PO, New Delhi-110011

(f) Last date of acceptance of RFI Response is **08 weeks** from date of **Pre-Response Vendor Interaction**. In case the responses are delivered by courier or through authorised company representatives, it is requested that they be delivered at Gate No 4 Sena Bhawan between 0900 hours and 1700 hours on all working days till the final date of submission of responses.

(g) Vendors short listed for issue of RFP would be intimated in due course of time.

14. The Government of India invites responses to this RFI only from OEM/ Authorised Vendors/ Industry. The end user of the equipment is the Indian Armed Forces (Indian Army).

15. This RFI is being issued with no financial commitment and the Ministry of Defence reserves the right to change or vary any part thereof at any stage. The Government of India also reserves the right to withdraw it should it be so necessary at any stage. The acquisition process would be carried out under provisions of the DAP-2020.

PART – III

GUIDELINES FOR VENDOR SELECTION / PRE-QUALIFICATION

16. Vendor Qualification Criteria has been promulgated by Acquisition Wing vide MoD ID No 4(3)/D(Acq)/16-Pt.IV dated 18/09/2019 or as updated on <http://mod.gov.in> (refer Annexure IV to Appendix A to Chapter II of DAP-2020). The Guidelines for vendor selection / pre-qualification for FICV(Tr) is attached at **Appendix 'D'** to RFI.

Conclusion

17. Vendors are requested to provide accurate inputs / responses so as to enable achieving main objectives of this RFI which are as follows:-

- (a) To formulate/ refine/ rationalise the SQRs for FICV(Tr).
- (b) To identify vendor base for development of FICV(Tr).
- (c) To generate inputs for structuring the RFP.
- (d) To aid in deciding the acquisition category for FICV(Tr).
- (e) To determine the indicative budgetary and cost implications.
- (f) To aid in deciding the desired maintenance philosophy i.e. whether to procure MRLS or opt for other modes of maintenance support like AMC/ CAMC etc.
- (g) To seek inputs for formulating Draft Trial Methodology.

Case File: A/36830/ FICV(Tr)/GS/MECH-8

Dated: 23 June 2021

Appendix 'A'

(refers to Paragraph 1 & 10 of FICV(Tr) RFI A/36830/FICV(Tr)/GS/MECH-8 dt 23 June 2021)

IMPORTANT TECHNICAL PARAMETERS: FICV(Tr)

1. FICV(Tr) should be configured on a **tracked chassis**.
2. **Service Life**. Vehicle service / operational life of at least **32 years with maximum one overhaul / repair intervention**.
3. **Transportability**. Capable of being transported by existing in-service tank transporter vehicles of the Indian Army, transport aircrafts of the Indian Air Force and broad-gauge railway military bogey.
4. **Version Specific Configuration**. FICV (Tr) will have to be supplied in following three versions with broad configuration as under: -

<u>Sr</u>	<u>Configuration</u>	<u>Gun Version</u>	<u>Command Version</u>	<u>Command & Surveillance Version</u>
(a)	Mobility & Protection	Common for all versions		
(b)	Armament			
	(i) Main Gun with co-axial Machine Gun	01 each	01 each	01 each
	(ii) Anti-tank Guided Missile	06	04	04
	(iii) Man Portable Ground Launcher	01	Nil	Nil
	(iv) Loiter Munition System	Nil	01 with at least 02 x projectiles	01 with at least 02 x projectiles
	(v) Mini-UAV System (VTOL)	Nil	Nil	01
	(vi) RCWS with AGS	01	01	01
(c)	Communication	02 x Radio Sets (BNE)	03 x Radio Sets (BNE)	03 x Radio Sets (BNE)
(d)	Silent APU	Yes	Yes	Yes
(e)	Crew + Stick	03 + ≥08	03 + ≥04	03 + ≥04
(f)	Quantity of FICV(Tr)	55%	20%	25%

5. **Mobility**.
 - (a) **Dimensions**. The dimensions of FICV(Tr) i.e. length, width and height should meet operational, transportability, amphibious/floatation and other technical requirements as stipulated in this RFI.
 - (b) **Weight**. Gross vehicle weight should permit floatation while including carriage capacity of **minimum 2.5 Tons of combat load** which includes crew, stick, all types of ammunition, FOL & combat stowage items.
 - (c) **Power to Weight Ratio**. At least **30 HP/Ton** in plain terrain with Gross Weight & all systems functioning including Temperature Control Unit.
 - (d) **Carrying Capacity (Combat Load)**. Combat load of 2.5 tons including personnel with all types of ammunition & combat stowage items.

- (e) **Speed.** Should have the following parameters at an average: -
- (i) On road speed - more than 70 kmph.
 - (ii) Cross country plain/ desert- more than 35 kmph.
 - (iii) Reverse speed on road - more than 20 kmph.
- (f) **Obstacle Crossing Capability.** Should be able to negotiate obstacles with full combat load as under: -
- (i) Gradient - not less than 30°.
 - (ii) Side Slope - not less than 20°.
 - (iii) Vertical Step - not less than 0.8 meters.
 - (iv) Trench Width - not less than 2.5 meters.
 - (v) Ground Clearance - not less than 450 mm.
 - (vi) **Amphibious / Floatation.** Should be amphibious at Gross Weight which includes 2.5 Tons of Combat Load without any external aids. It should have positive buoyancy to enable functionality of all on-board systems including sights and weapon systems during floatation. Following minimum floatation parameters are required: -
 - (aa) Achieve a minimum speed of 10 kmph in static water.
 - (ab) Capable to negotiate current speed up to 3 knots.
 - (ac) On the move & quick conversion into amphibious & land mode.
 - (ad) Enable firing from all on board armaments.
 - (ae) Field of view of driver to be similar to land mode.
 - (af) Angle of entry on hard ground: at least 30°.
 - (ag) Angle of exit on hard ground: at least 25°.
 - (ah) Angle of entry on soft and loose ground: at least 25°.
 - (ai) Angle of exit on soft and loose ground: at least 20°.
- (h) **Cruising/ Operating Range.** Minimum range of operation of the FICV(Tr) without external/ additional fuel tanks should be: -
- (i) On road - At least 400 km.
 - (ii) Cross country in plains- At least 300 km.
- (i) **Engine.** Diesel fuel-based engine/ power pack system preferably front mounted with low thermal & acoustic signature. Major parameters are as under: -
- (i) **Engine Service Life.** At least 1000 hours.
 - (ii) **Starting Mechanism.** At least two methods of starting engine including electric start with main battery. In addition to these, provision of slave start & tow start to be provided for use in case the main starting systems fail.
 - (iii) **Cold Starting.** FICV (Tr) should be provided with a suitable system for starting in low temperatures up to (-) 20°C.
- (j) **Transmission.** Should have an Automatic Transmission System with Hill-Assist facility and reduction gear for extra power.
- (k) **Steering System.** It should be a highly reliable power steering and provide precise control of the vehicle to the driver at various speeds, terrain conditions and load levels and provide capability for pivot turn.
- (l) **Suspension.** Suspension system should provide stable platform for accurate firing all armaments while on move and general comfort of all persons inside during cross country move.
- (m) **Braking System.** Efficient, dual and fail-safe braking system along with parking brakes.

- (i) **Main Brake**. It should hold FICV(Tr) on at least 30° gradient even when the engine gets switched off.
- (ii) **Parking Brake**. It should hold the vehicle on at least 30° gradient even when the engine gets switched off.
- (n) **Tracks**. Following specifications are essential: -
- (i) Minimum life of 5000 km.
 - (ii) Facility to attach/ inbuilt rubber/synthetic pads for driving on tarmac roads.
 - (iii) Mechanism for automatic/ remote adjustment of track tension.
 - (iv) Minimum four extra track links with connector pins should be provided as part of on board SPTA kit.
 - (v) Tracks and its associated sub-systems (horns, road-wheels, support rollers, sprockets etc) should be designed to prevent shedding of tracks while moving in desert/ loose sand.
- (o) **Self Recovery**. Independent self-recovery mechanism capable of winching FICV(Tr) with Gross Weight at a gradient of 25° on hard ground from a minimum distance of 15 meters.
6. **Armament/ Fire power**. The FICV(Tr) should have a **crew less turret** which can traverse 360° unlimited times in either direction. The following armaments should be incorporated in the turret: -
- (a) **Anti Tank Guided Missile (ATGM)**.
- (i) **Type**. A minimum 3rd generation Top-Attack ATGM should be provided. It should be capable to give under mentioned performance by day & night in terrain and ambient temperature conditions specified in this RFI:-
 - (aa) **Accuracy**. Hit probability of not less than 90% in stated terrain and temperature conditions including on a tank (NATO Tank Target) moving laterally at a speed of at least 15 km per hour while the FICV(Tr) is moving towards it at the same speed on level ground.
 - (ab) **Range**. The maximum range should not be less than 4000 m and minimum range not be more than 500 m.
 - (ac) **Penetration**. Penetrate at least 650 mm RHA beyond ERA.
 - (ad) **Launch**. Soft launch with smokeless propellant.
 - (ae) **Seeker**. Dual mode seeker to enable engagement of hot and cold targets in various visibility conditions. Facility of 'auto seeker lock on target'.
 - (af) **Man in Loop**. Capable to fire and update i.e. refine the impact point at terminal stage / switch targets mid-flight.
 - (ag) **Guidance System**. Wireless Guidance system.
 - (ah) **Warhead**. Interchangeable anti-armour/ anti-personal warheads or multi-purpose anti-armour, blast-penetration & HE warheads.
 - (ai) **Fuze**. Impact and programmable air-burst fuze for HE warhead.
 - (aj) **Weight**. ATGM with launch tube should be man-portable by a single soldier in combat mode.

(ii) **Rate of Fire.**

(aa) **Simultaneous Launch.** System to be capable of simultaneously firing one ATGM each by gunner and commander to engage same/ different targets in their common field of view.

(ab) **Successive Launch.** In the Gun Version, the system should be capable to launch at least 04 ATGMs within 30 seconds. In the other versions, the system should be capable to launch at least 02 ATGMs within 15 seconds.

(iii) **Stowage/ Launchers.** Stowage of minimum 06 ATGMs on-board the FICV(Tr) 'Gun Version' and 04 ATGMs on-board other versions should be provided. Launchers should preferably be provided on the turret however; the quantity of launchers may be decided by Vendor based on method planned for achieving 'Rate of Fire' mentioned at paragraph 6(a)(ii) above. In case stowage of reserve ATGMs is being planned, the crew should be able to quickly reload the on-board reserve missiles on the launchers from inside the FICV(Tr) either mechanically or manually without using any tools or equipment.

(iv) **Sighting System.** The sighting system should be common/ same as the Main Gun. Both commander & gunner should be able to acquire, track and engage with missile from respective stations (details of sighting system are given subsequently at Paragraph 6(k) ahead).

(v) **Missile Control Unit.** The Control Unit including Gun Control Equipment (GCE) and VDU for acquiring targets, launch and tracking of missiles to be common to that of the Main Gun and to be integrated with the FCS of FICV(Tr).

(b) **Man Portable Ground Launcher.** In addition to the Launchers fitted on the FICV(Tr), provision of a Man Portable Ground Launcher for ATGM to be provided in **FICV(Tr) Gun Version.** The Ground Launcher should be capable of firing the same missile mounted on the FICV(Tr). It should have following specifications:-

(i) It should consist of the following main components: -

(aa) Command and Launcher Unit (CLU).

(ab) Sighting System (Day and Thermal Imaging sight).

(ac) Mounting Unit along with harness.

(ii) **Weight.** Complete ground launcher with mounting unit and sighting system should weigh not more than 15 Kgs.

(iii) **Battery.** Rechargeable battery with endurance of at least 08 hr. Facility of charging the battery from FICV(Tr) or external source to be provided.

(iv) **Activation.** Activation into ground configuration from FICV(Tr) and vice-versa should not involve use of any mechanical tools.

(c) **Loiter Munition System.**

(i) **Type.** A tube/ canister launched Loiter Munition System with a capability to observe, identify and destroy non line-of-sight targets with all the way man in loop control and Lock-On After Launch (LOAL) to be provided in FICV(Tr) 'Command Version' and 'Command & Surveillance' Version as per configuration given at Paragraph 4 above. It should give minimum under mentioned performance by day & night in terrain & ambient temperature conditions specified in this RFI: -

(aa) **Accuracy.** 100% hit probability including on a moving target while FICV(Tr) is static.

(ab) **Range**. The range of data link to be at least 10 km with loiter time of at least 60 minutes.

(ac) **Warhead/ Target**. Multi mission capability and effective against armoured vehicles as well as personnel. The Loiter Munition should also have Top-Attack capability.

(ad) **Propulsion**. A smokeless launch and low acoustic propulsion system should be preferably provided.

(ae) **Flight Modes**. At least Fly to Coordinates, Fly by Camera Lock, Abort and Recovery modes to be provided.

(ii) **Sighting System**. The sighting system should be on board the Loiter Munition with capability of Fly-by-Camera Lock facility. It should transmit real time day/ night target intelligence to FCS of FICV(Tr). Both commander & gunner to be able to acquire, track and engage Loiter Munition from respective stations.

(iii) **Munition Control Unit**. The Munition Control Unit should be integrated with the FCS of the FICV(Tr). Abort, recovery and re-use capability should be provided.

(iv) **Stowage/ Launchers**. At least two ready to launch Loiter Munition to be provided on FICV(Tr). Stowage of minimum two additional Loiter Munition should be provided. Quantity of launchers may be decided by Vendor based on method planned for reloading subsequent Loiter Munitions. In case multiple launchers are not being provided, stowage of reserve Loiter Munitions should be so planned that the crew / stick should be able to quickly reload them on the launchers from inside the FICV(Tr) either mechanically or manually without using any special tools or equipment.

(v) **Data Terminal Unit (DTU)**. The DTU for communication link and for controlling the Loiter Munition should be provided on board FICV(Tr) with minimum deployment time and should not interfere with simultaneous firing of other weapons of FICV(Tr).

(d) **Mini-UAV System**.

(i) **Type**. 'Command & Surveillance' Version of FICV(Tr) to be provided with a Mini-UAV System at a scale of 01 x Mini-UAV per vehicle as per configuration given at Paragraph 4 above. The Mini-UAV System will be used for beyond line-of-sight Intelligence, Surveillance and Reconnaissance (ISR). The Mini-UAV should be compact, have Vertical Take-Off & Landing (VTOL) capability and continuous secure interface with its parent FICV(Tr) during flight.

(ii) **Capability**. It should have suitable payloads for ISR to give under mentioned performance by day & night in terrain & ambient temperature conditions specified in this RFI: -

(aa) Fully autonomous i.e. able to reach given location on a pre-designated route with & without control by pilot.

(ab) Endurance of at least 60 minutes.

(ac) Fly-by-Camera Lock, Fly-by-Coordinate and Auto Target Tracking ability with zoom-in and hover facility.

(ad) Transmit HD coloured & TI images/ videos to parent FICV(Tr) in real time.

(ae) Send accurate own location and height to parent FICV(Tr).

(af) The range of Mini-UAV/ its data link to be at least 10 km with endurance of at least 60 minutes. Altitude/ Above Sea Level (ASL) ceiling if any should permit operations in HAA terrain as mentioned in RFI. The ISR payload should have DRI of at least 5-3-2 kms

(ag) Securely send accurate coordinate & range data of target located at least 05 km away from Mini-UAV to enable engagement by other weapon systems like Mortars, Loiter Munition, Artillery, Attack Helicopters etc.

(ag) To be launched and controlled from inside FICV(Tr).

(ai) Ability to automatically avoid collision, terrain obstacles including vegetation during flight.

(aj) Ability to automatically return to parent FICV(Tr) when low on power & adverse weather and wind conditions.

(ak) Ability to automatically land and dock to Parent FICV(Tr).

(al) Ability to recharge on-board battery and upload/ download data when docked to FICV(Tr).

(am) System to be integrated to FCS and image/ data be displayed on existing VDUs.

(an) Wind Resistance of at least 40 km per hour.

(iii) **Ground Control Station (GCS)**. The GCS (for secure communication link & payload control during flight) should be integrated to FCS of FICV(Tr) to provide location coordinates of Mini-UAV & Target on digital map, real time video streaming and subsequent engagement by on-board/ other weapon systems.

(iv) **Docking Bay**. A suitable Docking Bay to be provided on FICV(Tr) to enable secured docking of Mini-UAV when not in flight. The Docking Bay apart from providing protection from dust, water, splinters etc should enable charging of on-board batteries and data upload/ download from its payload.

(e) **Main Gun**. The Main Gun should be integrated to FCS of FICV(Tr) and its Sighting System. Both commander & gunner should be able to acquire, track and engage targets with the Main Gun from respective stations. It should be capable of firing **at least 30mm calibre** ammunition both in direct firing and anti-aircraft role. The Main Gun should be capable of accurately & selectively fire on the move different types of ammunition. The Main Gun should have the following capabilities/ specifications:-

(i) **Likely Targets**.

(aa) Armoured vehicles at least 2000m range.

(ab) Dismounted / vehicle borne personnel at least 4000m range.

(ac) Field fortifications at least 4000m range.

(ad) Helicopters, slow moving aircrafts & unmanned drones at least 2500m.

(ii) **Desired Effect on Target**. The ammunition of the Main Gun should have the following capabilities:-

(aa) **Anti Armour**. A suitable round to penetrate armour at least 70mm RHA when fired at 60° from 1000m. Crew should be able to see flight/trajectory of anti armour round.

(ab) **Anti Field Fortifications**. A suitable round to breach at least 300mm reinforced concrete when fired from 1500m.

(ac) **Anti Aircraft & Personnel**. A suitable round having capability to effectively destroy helicopters, slow moving aircrafts, unmanned drones and personnel in open with fragments.

(ad) **Target Practice Tracer (TPT)**. Target Practice ammunition with tracers which are ballistically matched with the anti armour ammunition should be provided for training gunners and preserving live ammunition. (quantity requirement per year will be intimated in RFP).

(ae) **Drill Rounds**. Dummy ammunition with size, shape & weight similar to anti armour and anti aircraft/ personnel should be provided for training of crew in gunnery aspects. Quantity 30 rounds to be provided per FICV(Tr) as part of SPTA.

(iv) **Accuracy at Effective Range**.

(aa) **Anti Armour Ammunition**. At least 80% in single shot mode in stated terrain and temperature conditions including on a target (NATO Tank Target) moving laterally at a speed of at least 15 km per hour while the FICV(Tr) is moving towards it at the same speed on level ground.

(ab) **Anti Field Fortification/ Aircraft/ Personnel**: At least 80% in single shot mode.

(v) **Rate of Fire**. Apart from single shot mode of firing, the Main Gun should have capability to fire all types of ammunition in at least two additional modes (standard & rapid) to cater for rapid engagements and to compensate for accuracy.

(vi) **Feeding System**. Main Gun should have maximum on-board ammunition in ready-to-fire mode with a suitable feeding system to ensure selective firing/ chambering of anti-armour, anti-field fortification and anti-aircraft/ personnel ammunitions.

(vii) **Elevation & Depression Angles**. At least 74° elevation and 04° depression from level position.

(viii) **Ammunition Stowage**. At least 500 rounds with not less than 200 rounds of anti-armour and 300 rounds of anti-aircraft/ personnel and anti-field fortification in ready to fire mode.

(ix) **Alternate/ Manual Firing**. In case of failure of main electric circuit, alternate means of firing should be provided to the crew. Provision should be made for at least the gunner to have access to the 'crew-less' turret from his location inside FICV(Tr) to manually operate turret, sights, engage targets with all weapons and undertake manual loading/ unloading, cocking, firing, immediate repairs including rectification of faults, misfires, jams etc. Apart from individual hatches, at least one hatch should also be provided on the turret for entry / exit of crew in emergency situation.

(f) **Machine Gun (MG) Co-axial.** 01 x Machine Gun (MG) capable of firing **at least 7.62mm** ammunition. MG to be mounted coaxially to the Main Gun. It should be integrated to the FCS of the FICV(Tr). Its Sighting System, GCE and VDU should be same as that of the Main Gun. Both commander & gunner should be able to acquire, track and engage targets with the MG from respective stations. The MG should be capable of accurate firing on the move. The co-axial MG should have the following capabilities/ specifications:-

(i) **Likely Targets.**

(aa) Dismounted personnel at least 2000m range.

(ab) Vehicle detachments at least 2000m range.

(ac) Helicopters / unmanned drones at least 1000m range.

(ii) **Desired Effect on Target.** The ammunition of the MG should have the capabilities to penetrate at least STANAG Level-3 armour when fired from 30m. Crew should be able to see flight/ trajectory of bullets.

(iii) **Minimum Effective Range.** 1000m.

(iv) **Rate of Fire.** Apart from single shot mode of firing, the MG should have capability to fire in at least two additional modes (standard & rapid) to cater for rapid engagements and to compensate for accuracy.

(v) **Loading & Feeding System.** MG should have suitable ammunition loading and feeding system which can be operated by crew from inside the FICV(Tr). In case of power failure, alternate means of firing should be provided.

(vi) **Ammunition Stowage.** Ammunition stowage for MG should be at least 2000 rounds in ready to fire mode.

(vii) **Accuracy.** Minimum 30% in single shot mode in stated terrain and temperature conditions.

(viii) **Elevation& Depression.** Same as Main Gun.

(g) **Remote Controlled Weapon Station (RCWS) with Automatic Grenade Launcher System (AGS).** One AGS with an effective range of at least 1700m capable of firing **at least 30mm** AGS ammunition should be mounted on a Remote Controlled Weapon Station (RCWS) on the turret (over and above the stated height of FICV(Tr) however, overall height of FICV(Tr) to not exceed 3.5 meters). The RCWS should have a suitable independent combined electronic day & TI sighting system however it should be integrated with FCS of Main Gun. Commander / Gunner should be able to independently acquire, track and engage targets from respective station while the other crew may be engaging targets with Main Gun/ Co-axial MG/ ATGM. Ammunition stowage for AGS should be at least 250 rounds in ready to fire mode. The RCWS should be so designed that it can be used as a flexible mission pod which provides capability for subsequently replacing the AGS with installation of additional weapon like 7.62mm or 12.7mm Machine Gun (MG), Directed Energy Weapons (Laser) or other weapon systems.

(h) **Fire Control System (FCS).** The FICV(Tr) should have a computer based FCS integrating all Armaments, Sights, RCWS, LRFs, Ballistic Computer, Automatic Target Tracker (ATT), Control Units for Loiter Munition & ATGM, Mini-UAV, GCE, Armament Stabilisers, Meteorological Sensors, Navigation System, Communication System,

Laser Warning System (LWS), Active Protection System (APS) etc. It should provide following minimum facilities regarding firing of weapons: -

- (i) **Accuracy.** Assist in achieving stated accuracy of all armaments in stated terrain and temperature conditions including while target and FICV(Tr) are both moving.
 - (ii) **Feeding of Data.** All firing related inputs should be automatically fed into the FCS from various sources and it should also have a facility for manual inputs.
 - (iii) **Independent Control to Commander.** While Gunner is engaging targets from Main Gun/ MG/ ATGM, the Commander should be able to independently undertake following tasks:-
 - (aa) Detect/ acquire/ range/ track targets from his sight.
 - (ab) Bring aimed fire from AGS mounted on RCWS with stated accuracy.
 - (ac) Launch Mini-UAV.
 - (ad) Launch Loiter Munition.
 - (iv) **Over-Ride Facility.** Full override by Commander to control and fire all or selected on-board weapons including Loiter Munitions, ATGM and RCWS with stated accuracy.
 - (v) **Hunter-Killer.** Commander to have facility of designating a target and handing it over to gunner for subsequent tracking/ engagement by all weapons.
 - (vi) **Redundancy.** Gunner and Commander should have the facility to use sights including LRF of each other.
 - (vii) **Simultaneous Engagement.** Feasible to fire combination of weapons by Gunner and Commander simultaneously like RCWS-Main Gun, Main Gun-Loiter Munition, ATGM-Loiter Munition etc.
 - (viii) **Auto Target Tracking (ATT).** Artificial Intelligence enabled to auto detect, digitally mark and track targets including aerial targets/ drones.
 - (ix) **Mini-UAV & Loiter Munition Integration.** The GCS of Mini-UAV System and DTU of Loiter Munition System should be integrated to FCS to enable operation from inside FICV(Tr) including engaging targets by on-board/ other external weapon systems.
- (i) **Gun Control Equipment (GCE).** The GCE should have the following capabilities:-
- (i) Fully integrated with FCS, Sights and Visual Display Units (VDUs) to permit electrically acquiring targets and firing/ launching of all armaments of FICV(Tr) including Loiter Munitions and Mini-UAV.
 - (ii) Traverse all armaments including RCWS and Commander's Panoramic Sight (CPS) 360° unlimited times in either directions.
 - (iii) Elevate all armaments including RCWS.
 - (iv) Coarse and fine laying for all armaments with variable power traverse and elevation controls.
 - (v) Independent GCE (Control Unit) to be provided to both gunner and commander. Both Control Units should be identical however, Commander's Control Unit should have additional aspects for operation of CPS, Over-ride Control, Loiter Munition, Mini-UAV etc.

(vi) In case of failure of main system, manual/ alternate means of traversing turret, elevating Main Gun and firing/launching of all armaments including Loiter Munition and Mini-UAV to be provided to both gunner and commander.

(j) **Firing Port-Holes.** 01 x port hole on the rear to be provided for firing of 01 x personal weapon of Stick from inside the FICV(Tr).

(k) **Vision/ Surveillance Devices.** All digital vision/ surveillance sights should provide natural, hi-resolution, HD coloured images/ videos. All optical/ electronic sights and their displays should be military grade, water proof, dust proof, have defogging and self cleaning system. The following types of sighting systems are desired in FICV(Tr):-

(i) **Optical Vision Devices.** Apart from electronic sights, independent general vision optical periscope sights with **at least 160° combined horizontal field of view** to each crew member (commander, gunner & driver) should be provided.

(ii) **Driver's Sight.** Un-cooled combined coloured day & thermal sight (passive) with image fusion technology to be provided. It should have an identification range of at least 500m and at least 160° lateral Field of View (FOV). The image should be displayed in such a manner that the driver should be able to accurately/ precisely and comfortably drive the FICV(Tr) in all terrain, weather and operational conditions given in this RFI without use of any other vision device or external aid. Facility to display real time day & TI video of the vehicle's rear up to at least 50 m should also be provided. The sight should be integrated to the FCS for relevant functions like navigation, tactical, communication, vehicle performance / diagnostic data etc.

(iii) **Gunner's Main Sight (GMS).** The FICV(Tr) should have a dedicated electronic day and TI sight for Gunner with following characteristics:-

(aa) Should be fully stabilised sight integrated with FCS, LRF, GCE & ATT.

(ab) Capable of day and TI image fusion.

(ac) Minimum DRI ranges to be achieved are Detection: 08 km, Recognition: 05 km & Identification: 04 Km for a NATO Standard Tank Target of size 2.3m x 2.3m.

(ad) Gunner to be able to independently detect, acquire, range, track and bring precision aimed fire using all armaments viz Main Gun, MG, RCWS and ATGM with stated accuracy.

(ae) Artificial Intelligence enabled to automatically detect, digitally mark and track targets including aerial targets/ Drones.

(af) 01 x LRF to be integrated with the GMS. It should have an accuracy of at least 01 meter, maximum range of 10 kms and a minimum range of 400 m. Data from LRF to be displayed on VDU and integrated with FCS and GCE.

(iv) **Commander's Panoramic Sight (CPS).** The FICV(Tr) should have a dedicated panoramic sight for Commander with following characteristics:-

(aa) Should have technical specifications similar to GMS.

(ab) Should have capability of independent movement from turret. Unlimited 360° traverse in azimuth, at least 74° elevation and 04° depression.

(ad) Commander to be able to independently detect, acquire, range, track and bring aimed fire from all armaments viz Main Gun, MG, RCWS and ATGM with stated accuracy.

(ae) Facility to designate a target and handing it over to gunner for subsequent tracking / engagement.

(af) Artificial Intelligence enabled to automatically detect, digitally mark and track targets including aerial targets/ Drones.

(ag) Should be able to electrically elevate at least 500 mm above turret for 360° surveillance including firing of weapons.

(ah) 01 x LRF to be integrated with the GMS. It should have an accuracy of at least 01 meter, maximum range of 10 kms and a minimum range of 400 m. Data from LRF to be displayed on VDU and integrated with FCS and GCE.

(v) **Visual Display Units (VDUs)**.

(aa) Suitably placed military grade independent VDUs should be available to all crew members to view inputs from respective electronic sights as well as inputs fed from other electronic sights through the FCS including from the RCWS, Situational Awareness System, Loiter Munition & Mini-UAV.

(ab) The VDUs for Commander & Gunner should display natural, hi-resolution, HD coloured view by day & night either on suitably placed display panel. Additional head/ helmet mounted display to be provided for crew to display critical inputs for primary functions.

(ac) Quality of image/ video should enable automatic manual adjustment of brightness, contrast and focal length to suit individual users.

(ad) VDUs should permit touch-screen functions to execute certain actions of GCE (Control Unit).

(ae) Suitable number of display panels should also be installed in stick compartment to provide view from the Commander's Sight to personnel sitting as Stick.

(af) To increase crew's mission efficiency; terrain/ tactical/ situational update as well as armament/ vehicle performance & diagnostic data should be displayed/ overlaid in digital form on the VDUs and head/ helmet mounted displays.

(vii) **Situational Awareness System**. A suitable situational awareness solution to provide day & night real-time near natural 360° vision around the FICV(Tr) under closed hatches to the Commander should be provided. The system should produce a real-time fully stitched video and should allow Commander to 'see-through' the FICV(Tr) in real time, in visual and infra-red/ thermal modes up to at least 500m. The Situational Awareness System should be integrated to the FCS of FICV(Tr) and the output from it should be provided to Commander on a Head-up Display aligned to direction of his head. The output should also be available on the VDUs of Commander and in the Stick Compartment.

7. Protection.

- (a) **Front, Sides & Top.** A modular armour based system to provide at least STANAG-5 level protection in frontal arc and at least STANAG-4 level on other sides including top. Facility of additional STANAG-6 level protection in the frontal arc by means of removable armour panels should be provided.
- (b) **Belly.** At least STANAG Level 3B (Blast).
- (c) **Glasses.** At least STANAG-2 Level.
- (d) **Laser Warning System (LWS).** A LWS integrated to the FCS should be provided. When activated, it should be capable of detecting all kinds of lasers directed on the FICV(Tr) and provide audio visual warning to the crew. In addition to warnings, there should be provision to **selectively activate/ deactivate** following reactions when laser is detected:-
- (i) Simultaneous initiation of Anti-Thermal & Anti-Laser (ATAL) smoke screen indirection of incoming laser.
 - (ii) Automatically point CPS to the laser source.
 - (iii) Automatically traverse the turret to the laser source and fire a pre-designated weapon on it.
 - (iv) Provision to manually fire ATAL smoke shells in a desired direction for use as a smoke screen.
- (e) **Active Protection System (APS).** A stand-alone APS to effectively counter incoming direct & Top-Attack ATGMs, Drones, Rocket Propelled Grenades and KE ammunition to be provided.
- (f) **Spall Liners.** The interior of the crew and stick compartments should be fitted with spall liners to prevent injury to crew from fragments.
- (g) **CBRN Protection System.** Capable to detect all known types of Chemical Agents & Nuclear Radiations and provide protection to the crew, stick and sub systems against CBRN contamination for at least six hours continuously.
- (h) **Water, Moisture & Dust Protection.** All sights, sensors & sub systems which are mounted on the exterior of FICV(Tr) should be water, moisture & dust proof. No water and dust should enter into the crew, stick and engine compartments when all hatches are shut. In case there is ingress of water, effective bilge pumps should be provided for automatic & manual extraction of water to ensure no degradation in positive buoyancy and all systems of FICV(Tr) remain functional.
- (i) **Protection Against Fire.** A Fire Suppression System must be provided to automatically extinguish all kinds of fire inside crew, stick & engine compartments including turret. Additionally, sufficient quantities of manual fire extinguishing equipment should also be provided for extinguishing fire outside the FICV(Tr) and within crew / stick compartments.

8. Communication. FICV(Tr) should have following communication facilities:-

- (a) FICV(Tr) Gun Version to have qty 02 radio sets and FICV(Tr) Command, Command & Surveillance Version to have qty 03 radio sets. The radio sets should be located within arm's reach of Crew Commander and only **in-service radio sets (BNE)** will have to be installed.

(b) A suitable Digital Control Harness (DCH) for voice connection between the crew members including Stick Commander to be provided. The DCH should also enable reception/ transmission of data from/ to another FICV(Tr) in radio communication range.

(c) Hands-free & Cordless microphone & ear phones system mounted on an integrated headgear/ helmet. The system should have a range up to 500 m so as to enable communication with FICV(Tr) & out-stations when dismounted.

(d) Tactical/ Section Commander to be provided a light weight helmet mounted hands-free VHF radio set of at least 5000m range and compatible with on-board radio sets.

9. **Navigation System.** FICV(Tr) should have **in-service (BNE)** Advanced Land Navigation System (ALNS) which is a combined satellite and inertial navigation system. It should have following additional features:-

(a) **Data Input.** Crew Commander, Stick Commander and Driver should be able to independently input data / instructions to the navigation system through keys and voice. Data received from other sources like Mini-UAV, Loiter Munition, Radio Communication etc should also be integrated and displayed.

(b) **Display Panel.** No separate display panel for navigation system to be provided. The navigation data should be displayed/ overlaid in form of user friendly symbols / text on VDUs of GMS, CPS, Stick Commander and Driver.

(c) Commander should be able to observe navigation screen of Driver and feed navigation data like way-points, destination etc into Driver's system .

10. **Battlefield Management System (BMS).** A suitable and inbuilt BMS along with Identify Friend or Foe (IFF) System should be integrated into the FICV(Tr). The location coordinates of one FICV(Tr) should be automatically transferred at regular intervals to all other FICV(Tr) vehicles within radio communication range. The location of other FICV(Tr) vehicles should be displayed on VDU of Crew Commander in form of symbols duly superimposed on a terrain map. A suitable IFF system based on location and Artificial Intelligence (AI) should also be integrated in the BMS.

11. **Miscellaneous Technical Specifications.** The following additional technical features should be incorporated: -

(a) **Sub-systems & Assemblies.** The design of the sub-systems should be modular to the maximum extent possible, with easy accessibility to ensure quick replacement of faulty modules/ sub assemblies. All markings, manuals and literature should be in English & Hindi language.

(b) **Temperature Control System.** A suitable Temperature Control System for sensitive equipment, crew and sticks with capability to maintain 20° to 24°C temperature in an ambient temperature range between +40°C to +45°C (Summer) and 24°C to 28°C temperature in an ambient temperature range between (-)20°C to (-)10°C (Winter) to be provided. It should have provision of spot cooling/ heating of critical electronic components and for holding life saving injections/medicines.

(c) **Auxiliary Power Unit (APU).** An in-built silent APU should be provided in FICV(Tr). APU should supply electric power for minimum 06 hours, when engine is

switched off. APU should be able to concurrently operate the following systems of FICV(Tr):-

- (i) Gunner, Commander and Driver Sights (Day & Ni).
 - (ii) At least 6 x 360° rotations of the turret in each hour for 06 hours.
 - (iii) Fire Control System including firing of all armaments.
 - (iv) Loiter Munitions firing & control.
 - (v) Mini-UAV launching & control.
 - (vi) Radio Sets.
 - (vii) Inter Communication System/ Digital Control Harness.
 - (viii) Navigation Equipment (Satellite Navigation only).
 - (ix) Situational Awareness System.
 - (x) All Protection Systems including Counter Measure Systems.
- (d) **Smoke Generation**. Engine should be capable of generating continuous smoke for at least three minutes.
- (e) **Ergonomics**. The seating arrangement including leg-room, orientation and posture should facilitate continuous operations by crew and stick while travelling under operational conditions.
- (f) **Seats**. Blast attenuating cushioned seats with shock dampeners, headrest and Built-in Five Point Seat Belts for Stick and crew (4-way adjustable).
- (g) **Entry/Exit for Crew and Stick**.
- (i) **Hatches**. Individual entry/ exit hatches for each crew to be provided. Additional hatch should be provided on turret for emergency exit/ entry of crew and stick. Sufficient hatches for exit/ entry should also be provided on roof of Stick Compartment. These hatches when open should enable Stick in using their personal weapons when firing from inside Stick Compartment.
 - (ii) **Ramp Door**. One power assisted ramp type door on the rear hull wall for entry/ exit of the Stick/ Crew to be provided. Facility to manually/ mechanically operate the ramp should also be provided to cater for failure of main operating system.
- (h) **Stowage Facility**. Dedicated, customised, modular & directly accessible stowage facility should be provided for following items:-
- (i) **Internal Stowage**. Personal weapons, ammunition, reserve ATGMs & Loiter Munitions, first-aid kits and combat equipment of crew and stick.
 - (ii) **External Stowage**. Camouflage net, outer protective cover for vehicle and outdoor shelters for crew & stick.
 - (iii) Dedicated internal/ external stowage for all Spares Parts, Tools and Accessories (SPTA) should be provided.
- (i) **Ammunition Loading**. The loading/ unloading of all types of ammunition and ammunition belts including ATGMs and Loiter Munitions into the FICV(Tr) under field conditions should be assisted by mechanical/ electric means.
- (j) **Water Storage**. Provision for 225 litres of drinking water should be provided in FICV(Tr) at same temperature that is existing inside Stick Compartment. Suitable inlets, outlets, drainage, plumbing and provisions for cleaning should be provided.
- (k) **Tow Hooks**. Sufficient Tow Hooks with ropes and recovery accessories should be provided in front and rear for towing FICV(Tr) through mud, sand, slush, snow etc. Hoisting hooks for complete FICV(Tr) and also for independent hoisting of its major

sub-systems like turret, engine, transmission system, coolers, APU etc should be provided.

(l) **Contour lights**. Contour lights on all sides with facility to individually control brightness, blink/ static and colour (red, amber, green & white) to be provided.

(m) **Covers & Shelters**. Water proof cover for FICV(Tr) designed to be used as an external shelter for crew & sticks should be provided (shelter for crew and sticks should be separate). It should be made from fire resistant material and have dedicated stowage space on the vehicle.

(n) **Paint**. Vehicle should be painted with Anti-IR paint in terrain specific camouflaged pattern as approved by user.

12. **Maintainability**.

(a) Modular systems & sub-systems to be provided to enable quick replacements & repairs at field workshop level. Maintenance Transfer of Technology (MToT) for sustenance of FICV(Tr) should be provided. Maintenance, Repair & Overhaul (MRO) philosophy should be aligned to following levels of repairs (refer Appendix E to Schedule I to Chapter II DAP):-

(i) **Unit (Organisational 1 (O1) Level**. Repairs carried out in the unit holding the equipment, involving replacement of minor components/ sub-assemblies, which do not require any Special Maintenance Tools (SMTs).

(ii) **Field (Organisational 2 (O2) Level**. Repairs by a field workshop, involving replacement of components/ major sub-assemblies, which may require Special Maintenance Tools (SMTs) supported by diagnostics using Special Test Equipments (STEs)/ Test Jigs/ Built In Test Equipments (BITE) facility.

(iii) **Intermediate (I) Level**. Repairs beyond the scope of field workshop, which require sophisticated Special Test Equipments (STEs)/ Test Jigs for diagnostics. These include repairs to rotables/ sub-assemblies through repairs/ replacements of PCBs/ modules/ components.

(iv) **Base (Depot (D)) Level**. Base repair capability is established to avoid dependence on manufacturer in terms of factory repairs. These repairs include component level repairs of rotables/ assemblies, which may be Major Unit Assembly (MUA)/ modules/ PCBs.

(b) **Built in Test Equipment (BITE)**. Artificial Intelligence based built in diagnostic facility for all major systems and critical sub assemblies should be provided.

13. **Quality Assurance**. FICV(Tr) and all system should be robust in construction & comply to following:-

(a) JSS: 55555.

(b) MIL STD-461E for EMI/ EMC parameters.

14. **Training Aids**. The following training aids should be planned to be provided (scale will be given in RFP):-

(a) Integrated technical training simulators for driving & gunnery aspects.

(b) Individual Simulators for Loiter Munition, Mini-UAV and for training on tactical employment of FICV(Tr) at battalion level.

(c) Sectionised working models and cut models of all major and minor assemblies.

(d) AR/ VR and Computer Based training packages for honing skills to operate, maintain and repair all automotive & armament sub-systems.

Appendix 'B'

(Refers to Paragraph 13(a) of RFI A/36830/FICV(Tr)/GS/MECH-8 dt 23 June 2021)

VENDOR RESPONSE FORM / QUESTIONNAIRE

<u>Q No</u>	<u>Questionnaire</u>	<u>Response</u>
1.	Can you confirm that conditions mentioned at Paragraph 12 of RFI are acceptable?	Yes / No
2.	Can you indigenously design, develop & manufacture FICV(Tr) as per technical parameters given in RFI with a minimum of 50% Indigenous Content (IC) on cost basis of the base contract price i.e. total contract price less taxes & duties for procurement under Buy (Indian-IDDM) category of DAP-20 ?	Yes / No
3.	In case Buy (Indian-IDDM) category is not possible, can you supply FICV(Tr) as per technical parameters given in this RFI through initial acquisition of equipment in Fully Formed (FF) state in quantities as considered necessary by engaging in a tie-up with a foreign Original Equipment Manufacturer (OEM), followed by indigenous production in a phased manner involving Transfer of Technology (ToT) of critical technologies as per specified range, depth and scope from the foreign OEM & achieve a minimum of 50% IC on cost basis of the Make portion of the contract less taxes and duties for procurement under Buy & Make (Indian) category of DAP-20 ?	Yes / No
4.	In case Buy & Make (Indian) category of procurement is recommended, can you supply FICV (Tr) without any initial procurement of FICV (Tr) from foreign OEM in Fully Formed (FF) state?	Yes / No
5.	What is your desired procurement categorisation for this Project along with justification ?	
6.	Can you commence supply of FICV(Tr) within 02 years of Contract @ 75-100 FICV(Tr) per year (as stated in the RFI)?	Yes / No
7.	If NO then give your preferred time-line and quantity per year?	_ yrs @ __/yr
8.	How much time in months is required to make available one prototype of FICV (Tr) 'Gun Version' for Field Trials?	__ months
9.	How much time in months is required to make available one prototype each of FICV (Tr) 'Gun Version', 'Command Version' & 'Command & Surveillance Version' for Field Trials?	__ months
10.	In case initial quantities of FICV (Tr) being provided are in FF state, then specify likely time-lines for achieving IM capability	_ months
11.	Can FICV(Tr) be supplied as per Three-Stage Induction Model defined in RFI?	Yes / No
12.	If NO then what is your proposal to cater for product improvement and upgrades?	
13.	What will be your production capacity (numbers per year) and likely delivery schedule for qty 1750 FICV (Tr) from the date of signing contract?	(a) _ per year (b) FF/SKD/ CKD/ IM

Q No	Questionnaire				Response
14.	Does the company guarantee indigenous spare and maintenance support (MToT) till end of life of FICV (Tr)?				Yes / No
15.	Please provide List & Cost of systems & components that are likely to have Foreign Content .				
16.	Please specify Scope, Depth & Range of ToT for FICV(Tr) that will be available from Foreign OEM for:-				
	(a) Design/ Development (if applicable).				
	(b) Manufacture of systems, sub-systems, assemblies, components, materials etc.				
	(c) Production from Completely Knocked Down (CKD)/ Semi Knocked Down (SKD) kits.				
17.	List of Critical Technologies & Military Materials for which ToT is <u>not</u> likely to be provided by foreign partners				
18.	Indigenous Military Material. Based on volume of utilisation (<u>at production stage</u>), please provide details of systems & sub-systems where military material will be used from indigenous sources for FICV(Tr) (refer Chapter II Paragraph 09 to 12 of DAP-2020) under following heads:-				
	SNo	System	Sub-System	Indigenous Military Material will be Used	Reasons for Not Using Indigenous Military Material
	(a)	Material for Armour		Yes / No	
	(b)	Chassis / Hull / Turret		Yes / No	
	(c)	Automotive Systems		Yes / No	
	(d)	Armament		Yes / No	
	(e)	Communication		Yes / No	
	(f)	Optics		Yes / No	
	(g)	Electronics		Yes / No	
	(h)	Explosives & Propellants		Yes / No	
	(i)	Ammunition & Penetrator		Yes / No	
	(j)	Rubber Seals & Parts		Yes / No	
	(k)	Plastic / Composite		Yes / No	
	(l)	Any other System		Yes / No	
19.	Indigenous Software. Please provide details of systems, sub-systems & equipment which can use indigenous software for running applications in FICV(Tr):-				
	SNo	System	Sub-System	Applications which will use Indigenous Software	Reasons for Not Using Indigenous Software
	(a)	Fire Control (FCS)		Yes / No	
	(b)	Sighting System		Yes / No	

Q No	Questionnaire				Response
SNo	System	Sub-System	Applications which will use Indigenous Software	Reasons for Not Using Indigenous Software	
(c)	Active Protection System(APS)		Yes / No		
(d)	Laser Warning System (LWS)		Yes / No		
(e)	Automotive Diagnostics		Yes / No		
(f)	Situational Awareness		Yes / No		
(g)	Communication& DCH		Yes / No		
(h)	Navigation		Yes / No		
(i)	Fire Detection & Suppression		Yes / No		
(j)	CBRN		Yes / No		
(k)	Any Other		Yes / No		
20.	Please provide tentative Basic Cost in ₹ without any taxes and duties of following:-				Cost in ₹
	(a) One FICV(Tr) 'Gun Version'without ammunition				
	(b) One FICV(Tr) 'Command Version'without ammunition				
	(c) One FICV(Tr) 'Command& Surveillance Version'without ammunition				
	(d) Cost of ammunition qty 500 for Main Gun (AP: qty 200 & HE: qty 300)				
	(e) Cost of ammunition qty 2000 for MG				
	(f) Cost of ammunition qty 250 for AGS				
	(g) Cost of one ATGM				
	(h) Cost of one Man Portable Ground Launcher for ATGM				
	(i) Cost of one Ammunition of Loiter Munition System				
	(j) Cost of one Mini-UAV System				
	(k) Cost of CAMC for qty 50 FICV(Tr)				
	(l) Cost of MRLS for qty 50 FICV(Tr)				
	(m) Cost of SMT for qty 50 FICV(Tr)				
	(n) Cost of STE for qty 50 FICV(Tr)				
	(o) Cost of 01 x set of Training Aggregates				
21.	Paragraph wise response on technical characteristics of FICV (Tr) offered/ proposed by you to be submitted as per questionnaire given in Annexure I to this Appendix.				

Annexure I

(refers to Para 21 of Appendix 'B')

INFORMATION ON TECHNICAL CHARACTERISTICS OF PRODUCT OFFERED

<u>Question</u>	<u>Questionnaire based on RFI for FICV(Tr)</u>		<u>Response</u>																																												
1.	Can you supply FICV(Tr) as per all technical parameters given at Appendix 'A' to the RFI?		Yes/No																																												
Note:																																															
A. Even if your reply to Question-1 above is 'YES', response to all questions below is mandatory.																																															
B. Questions with remarks 'if any' or 'if available' may not be responded.																																															
2.	(a) Briefly give out the configuration and description of your product for FICV(Tr) along with technical literature and photographs / sketches / CAD drawings including layout of seating arrangement & location of crew, hatches, placement of weapons, ammunition etc.																																														
	(b) What service/operational life can be offered in FICV(Tr) without any repair intervention / over haul?		__ years																																												
	(c) Can you provide FICV(Tr) in 'Gun', 'Command' and 'Command & Surveillance' Versions as asked in RFI		Yes / No																																												
	(d) Can your FICV(Tr) perform operational tasks in the Plains & Desert terrain in weather and temperature conditions mentioned in the RFI?		Yes/No																																												
	(e) Can your FICV(Tr) perform operational tasks in High Altitude/ Mountain terrain in weather and temperature conditions mentioned in the RFI?		Yes / No																																												
	(f) Dimensions. Please mention the dimensions of your FICV(Tr) in the following format:-																																														
	<table border="1"> <thead> <tr> <th>Name of Your FICV(Tr)</th> <th>Version</th> <th>Length(m)</th> <th>Width (mm)</th> <th>Height less RCWS (mm)</th> <th>Height with RCWS (mm)</th> <th>Vehicle Weight (kg)</th> <th>Payload Capacity (kg)</th> <th>Ground Clearance (mm)</th> <th>Crew Strength</th> <th>Max Stick Strength</th> </tr> </thead> <tbody> <tr> <td></td> <td>(a) Gun</td> <td></td> <td></td> <td></td> <td></td> <td></td> <td></td> <td></td> <td></td> <td></td> </tr> <tr> <td></td> <td>(b) Command</td> <td></td> <td></td> <td></td> <td></td> <td></td> <td></td> <td></td> <td></td> <td></td> </tr> <tr> <td></td> <td>(c) Command&Surveillance</td> <td></td> <td></td> <td></td> <td></td> <td></td> <td></td> <td></td> <td></td> <td></td> </tr> </tbody> </table>	Name of Your FICV(Tr)	Version	Length(m)	Width (mm)	Height less RCWS (mm)	Height with RCWS (mm)	Vehicle Weight (kg)	Payload Capacity (kg)	Ground Clearance (mm)	Crew Strength	Max Stick Strength		(a) Gun											(b) Command											(c) Command&Surveillance											
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Question	Questionnaire based on RFI for FICV(Tr)	Response
3.	<p>Mobility. Provide following details of your proposal for FICV(Tr):-</p> <p>(a) Weight Please specify the Gross vehicle weight to permit floatation with full combat load of 2.5 ton</p> <p>(b) Carrying Capacity (Combat Load) Can your vehicle carry full combat load of 2.5 tons.</p> <p>(c) Power to Weight Ratio. What Power to Weight ratio can be offered in your FICV(Tr) in plains?</p> <p>(d) How much Power to Weight Ratio can be achieved in High Altitude Terrain(de-rating)</p> <p>(e) Speed. What max speed can be achieved by your FICV(Tr) in following parameters:-</p> <p>(i) Max speed on road</p> <p>(ii) Max speed off-road / cross country in plain terrain</p> <p>(iii) Max speed off-road / cross country in desert terrain</p> <p>(iv) Max speed off-road / cross country in reverse gear on road</p> <p>(v) Acceleration on plain hard ground in terms of 0 to 30kmph in __ seconds of your product</p> <p>(f) Obstacle Crossing Capability. What max obstacle crossing capability can be achieved:-</p> <p>(i) Max gradient climbing on hard surface (concrete / stone)</p> <p>(ii) Max gradient climbing off-road in hard plain terrain</p> <p>(iii) Max gradient climbing off-road in desert terrain (sand)</p> <p>(iv) Max side slope negotiation on hard surface (concrete / stone)</p> <p>(v) Max vertical step climbing on hard surface (concrete / stone)</p> <p>(vi) Max horizontal gap / trench on hard surface (concrete / stone) that can be crossed</p> <p>(vii) Amphibious Capability. What amphibious capability can be achieved by your FICV(Tr)</p> <p>(aa) Max Speed that can be achieved in static water</p> <p>(ab) Max Water Current (knots) in which FICV(Tr) can cross over to other bank</p> <p>(ac) Max Angle of Entry & Exit on Hard Surface (concrete / stone) -</p> <p>(ad) Max Angle of Entry & Exit on Natural Surface(Soft & Loose Ground)</p> <p>(ae) Free-Board Height in static water</p> <p>(af) Which on-board weapon systems & sights cannot function during floatation?</p> <p>(ag) Max distance FICV(Tr) can travel in static water</p> <p>(ah) For how many hours can FICV(Tr) remain afloat with all systems off</p>	<p>__ Ton</p> <p>Yes/No</p> <p>__ HP/Ton</p> <p>__ HP/Ton</p> <p>__ kmph</p> <p>__ kmph</p> <p>__ kmph</p> <p>__ kmph</p> <p>__ kmph</p> <p>__ degrees</p> <p>__ degrees</p> <p>__ degrees</p> <p>__ degrees</p> <p>__ meters</p> <p>__ meters</p> <p>__ kmph</p> <p>__ knots</p> <p>__ degrees</p> <p>__ degrees</p> <p>__ mm</p> <p>__ kms</p> <p>__ hrs</p>

Question	Questionnaire based on RFI for FICV(Tr)	Response
	(ai) Can FICV(Tr) be used for amphibious role in marine environment	Yes / No
	(g) Cruising Ranges. What Cruising Ranges can be offered in your FICV(Tr) in following parameters:-	
	(i) Max range that can be travelled on level road in plain terrain	__ km
	(ii) Max range that can be travelled off-road / cross country in plain terrain	__ km
	(iii) Total Fuel Capacity of Fuel Tank(s)	__ Litres
	(iv) Average Speed that is being considered for calculating Max Cruising Range	__ kmph
	(h) Engine. What Engine Specifications can be offered in your FICV(Tr) in following parameters:-	
	(i) Design, type & technical details of engine that will be provided for FICV(Tr)	if available
	(ii) Name of original manufacturer of engine	if available
	(iii) Max Engine Service Life (in hours)	__ hours
	(iv) Min operating temperature (in degrees Celsius)	__° Celsius
	(v) Max operating temperature (in degrees Celsius)	__° Celsius
	(vi) What is life expectancy of engine without any repair intervention	__ hours
	(vii) What is Mean Time Between Failure (MTBF)	__ hours
	(viii) Can a Front Mounted Engine be provided in FICV(Tr)	Yes / No
	(ix) Max Power output in terms of Horse Power per Ton (HP/T) and Brake Horse Power(BHP)	__ HP/T __ BHP
	(x) Types of Fuel that can be used (mention grades)	
	(xi) Type of Fuel Injection System & Engine Cooling System being used	
	(xii) Details of lubricants / oils and its grade	if available
	(xiii) Types of Engine Starting System that can be provided other than tow and jump start	
	(xiv) Can a system be provided for instant starting of engine when ambient temperatures is (-)20°C	Yes / No
	(xv) What is the proposed location of engine exhaust vent on hull	Roof/Side
	(xvi) What measures can be provided to reduce thermal & acoustic signatures of the engine	
	(xvii) Can your engine produce smoke as asked in RFI	Yes/ No
	(i) Transmission System. What specifications of Transmission System can be offered in your FICV(Tr):-	
	(i) Design, type & technical details of Transmission System that will be provided	if available

Question	Questionnaire based on RFI for FICV(Tr)	Response
	(ii) Name of original manufacturer of Transmission System	if available
	(iii) Can you provide fully automatic transmission system	Yes / No
	(iv) Technical description of gears both forward & reverse	if available
	(v) Can a reduction gear for extra power be provided	Yes / No
	(vi) Feasibility of providing <i>variable reduction</i> gear to facilitate optimal power to negotiate difficult terrain e.g. slush, sand, steep incline, snow etc with minimum compromise on speed.	Yes / No
	(vii) Details & grades of Lubricants / oils	if available
	(viii) What is the life expectancy without any repair intervention	__ hours
	(ix) What is Mean Time Between Failure (MTBF)	__ hours
	(j) Steering System. What specifications of Steering System can be offered in your FICV(Tr) in following parameters:-	
	(i) Design, type, technical details of Steering System that will be provided for FICV(Tr)	
	(ii) Name of original manufacturer of Steering System	if available
	(iii) What is min free play that would be present in the steering system	__ mm
	(iii) What type of oil is required for Steering System (mention grade)	
	(iv) Is pivot turn feasible	Yes / No
	(v) If Pivot Turn is not feasible, what turning radius (in mm) will be offered in your FICV(Tr)	__ mm
	(k) Suspension System. Specifications of Suspension System that will be offered in your FICV(Tr):-	
	(i) Design, type, technical details of Suspension System	
	(ii) Is the oil / gas required for Suspension System indigenous / imported (mention grade)	
	(iii) Can facility of achieving variable height of FICV(Tr) be provided in the Suspension System	Yes / No
3.	(l) Braking System. What specifications of Braking System can be offered in your FICV(Tr) in following parameters:-	
	(i) Design, type, technical details of Braking System that will be provided	if available
	(ii) Is the oil required for Braking System indigenous / imported (mention grade)	if available
	(iii) What system is being provided for achieving braking in case the main system fails	
	(iv) What Braking Distance can be achieved by your product at Gross Weight & 70 kmph on road	__ m
	(v) Will Main Brakes function when engine gets switched off while vehicle is still moving	Yes/No
	(vi) Can Main Brake hold FICV(Tr) with gross weight on at least 30° gradient when engine is on	Yes/No

<u>Question</u>	<u>Questionnaire based on RFI for FICV(Tr)</u>	<u>Response</u>
	(vii) If not then up to what gradient can Main Brake hold FICV(Tr) with gross weight when engine is on	__ °
	(viii) Can Main Brake hold FICV(Tr) with gross weight on at least 30° gradient even when engine is off	Yes/No
	(ix) If NO then up to what gradient can Main Brake hold FICV(Tr) with gross weight when engine is off	__ °
	(x) Can Parking Brake hold FICV(Tr)with gross weight on at least 30° gradient.	Yes/No
	(xi) If NO then up to what gradient can Parking Main Brake hold FICV(Tr) with gross weight	__ °
	(ix) Is it feasible to provide audio & visual warnings to indicate manual / parking brake is engaged	Yes/No
	(x) Is it feasible to incorporate mechanism which automatically prevents automatic rolling back/ acceleration of FICV(Tr) when climbing/ descending a gradient (Hill-Assist System)	Yes/No
	(m) <u>Self Recovery</u>	
	(i) Can an independent self-recovery mechanism capable of winching FICV(Tr) with Gross Weight at a gradient of 25° on hard ground from a minimum distance of 15 meters be provided	Yes / No
	(ii) If no then specify the capability of your self recovery mechanism	
	(n) <u>Tracks.</u> What specifications of Tracks can be offered in your FICV(Tr) in following parameters:-	
	(i) Design, type & technical details of Tracks that will be provided in FICV(Tr) including type & numbers of sprockets, support rollers, track horns, road wheels etc.	if available
	(ii) What is the life of tracks before replacement would be due	__ kms
	(iii) Can mechanism for automatic measurement & remote adjustment of track tension be provided	Yes / No
	(iv) How many spare track links will be provided per FICV(Tr)	__ qty
	(v) Can track links be replaced by crew in field conditions without any workshop support	Yes / No
	(vi) What provision can be provided for preventing damage to tarmac roads	
	(vii) In case rubber or synthetic pads / attachments are sought for movement on tarmac roads, will they be fitted permanently on the tracks	Yes / No
	(viii) In case removable rubber or synthetic pads / attachments are sought for movement on tarmac roads, can they be fitted and removed by crew without workshop support	Yes / No
	(ix) How much time will a trained crew take for fitting / removing these attachments in field conditions	__ mins
	(x) What is life of these attachments (in kms)	__kms
	(xi) Can they be used multiple times during stated life	Yes / No
3.	(xii) Will these attachments get damaged in case used off-road	Yes / No

Question	Questionnaire based on RFI for FICV(Tr)	Response
4.	Armament. In your proposal for FICV(Tr):-	
	(a) Can a crew less turret be provided?	Yes / No
	(b) If YES, then can access be provided inside turret to Gunner for manual operation/ fault removal of armaments & sub-systems	Yes / No
	(c) Give details of the layout of the turret to include placement of all weapons, ammunition stowage and major sub systems (photographs, CAD drawings, diagrams or sketch if available may be attached).	
	(d) If crew less turret can be provided then give layout & position of crew inside FICV(Tr)	
	(e) If crew less turret cannot be provided then give suggested layout & position of crew inside turret	
	(f) Loiter Munition System. In your proposal for FICV(Tr):-	
	(i) Can a Loiter Munition System as asked in RFI be integrated on FICV(Tr)	Yes / No
	(ii) What accuracy/CEP can be provided when both target (NATO Tank Target) and FICV(Tr) are static	_% or _ m
	(iii) What accuracy/CEP can be provided when target is moving but FICV(Tr) is static.	_% or _ m
	(iv) Can stated Accuracy/CEP be achieved when both target and FICV(Tr) are moving.	Yes / No
	(v) What max range of data link / distance can be provided.	__ meter
	(vi) What is the max loiter time / endurance that can be provided.	__ minutes
	(vii) Can Multi Mission Capability (i.e. anti armour, personnel & building) be provided on same Munition	Yes / No
	(viii) Will the Loiter Munition have Top-Attack capability.	Yes / No
	(ix) What depth of penetration can be achieved against RHA	__ mm
	(x) Will the anti tank warhead have tandem warhead to counter ERA	Yes / No
	(xi) Can pneumatic launch mechanism for launching projectile be provided	Yes / No
	(xii) If not then what type of launch mechanism for Loiter Munition will be provided on FICV(Tr)	
	(xiii) Can all electric propulsion system be provided to Loiter Munition post launch	Yes / No
	(xiv) If no then what type of propulsion will be provided to the Loiter Munition post launch	
	(xv) What would be the weather / temperature restrictions for use of Loiter Munition	
	(xvi) Details of sighting system that will be provided on Loiter Munition	
	(xvii) Can real time target intelligence be transmitted to dedicated FICV(Tr).	Yes / No
	(xviii) Can firing, control & operation of Loiter Munition projectile be integrated to FCS & VDU of FICV(Tr)	Yes / No

<u>Question</u>	<u>Questionnaire based on RFI for FICV(Tr)</u>	<u>Response</u>
	(xix) Can Fly to Coordinate, Fly by Camera Lock, abort, recovery and re-attack capability be provided.	Yes / No
	(xx) How many reserve Loiter Munition Projectiles be provided on FICV(Tr)	__ qty
	(xxi) Time required for deployment of Data Terminal Unit (DTU)	__ seconds
	(xxii) Can other weapons be used when DTU is deployed & Loiter Munition is airborne.	Yes / No
	(xxiii) Can FICV(Tr) be moved when Data Terminal Unit is deployed and Loiter Munition is airborne.	Yes / No
	(xxiv) Is it feasible to incorporate Defence Series Maps (DSM)	Yes / No
	(xxv) Additional Technical Details of Loiter Munition System that will be installed on FICV(Tr)	if available
	(g) <u>Mini-UAV System.</u>	
	(i) Can system for docking, launching & integrating a Mini-UAV as asked in RFI be provided in FICV(Tr)	Yes / No
	(ii) Is VTOL capability feasible	Yes / No
	(iii) Is continuous secure interface with parent FICV(Tr) feasible	Yes / No
	(iv) Will Mini-UAV be fully autonomous to reach given location on pre-designated route	Yes / No
	(v) Can Mini-UAV hover over a designated location	Yes / No
	(vi) Can the ISR payload auto track a designated target by day & night	Yes / No
	(vii) Can Mini-UAV undertake "Fly-by-Camera Lock" & "Fly to Coordinate" movement	Yes / No
	(viii) Will the payload have optical / digital zooming facility	Optical/Digital/Combined
	(ix) What max range of data link can be provided	__ m
	(x) What max DRI range can be provided for ISR Payload of your Mini-UAV (in kms)	__-__-__km
	(xi) What is the max flight endurance that can be provided	__ minutes
	(xii) Can HD Coloured & Thermal images/ video be transmitted to parent FICV(Tr) in real time	Yes / No
	(xiii) Can it send accurate own location and height to parent FICV(Tr) in real time	Yes / No
	(xiv) Can it send accurate coordinates & data of target located at least 05 km away to enable engagement by other weapon systems like Mortars, Loiter Munition, Artillery, Attack Helicopters etc.	Yes / No
	(xv) Is it feasible to incorporate Defence Series Maps (DSM), Injection of Raster Maps, GIS ready maps and display in IMGR	Yes / No
	(xvi) Is it feasible to fully integrate GCS with FCS of FICV(Tr) to provide location coordinates of Mini-UAV & Target on digital map, real time video streaming and subsequent engagement by on-board weapons	Yes / No
	(xvii) Can Mini-UAV system be integrated to FCS & real time image/ data be displayed on existing VDUs	Yes / No

<u>Question</u>	<u>Questionnaire based on RFI for FICV(Tr)</u>	<u>Response</u>
	(xviii) Can it be launched and controlled from inside FICV(Tr)	Yes / No
	(xix) Will it be able to automatically avoid collision, terrain obstacles including vegetation during flight.	Yes / No
	(xx) Will it be able to automatically return to parent FICV(Tr) when low on power & adverse weather& wind conditions	Yes / No
	(xxi) Will it have capability to automatically land and dock to parent FICV(Tr)	Yes / No
	(xxii) Will it be feasible to recharge on-board battery & upload/ download data when docked to FICV(Tr)	Yes / No
	(xxiii) Your Mini-UAV will be able to resist wind speeds up to how many km per hour	__ km/hour
	(xxiv) What is the service life of Mini-UAV without any repair interventions (in flying hours)	__ hours
	(xxv) Docking Bay. Will a suitable Docking Bay be provided on FICV(Tr) to enable secured docking of Mini-UAV when not in flight.	Yes / No
	(xxvi) Will the Docking Bay provide protection from dust, water, splinters etc to the Mini-UAV when docked	Yes / No
	(xxvii) Dimensions (Length x Width x Height) of Mini-UAV in Docking Position in mm	_ x _ x _mm
	(xxviii) Will Docking Bay pose any restrictions on firing and automotive performance of FICV(Tr)	Yes / No
	(xxix) Can propulsion to Mini-UAV be provided through electric power	Yes / No
	(xxx) Provide technical specifications of Mini-UAV, ISR payload, Propulsion System & Docking Bay being provided for FICV(Tr)	If available
	(h) ATGM System. In your proposal for FICV(Tr):-	
	(i) Can 3 rd Generation top attack ATGM as per technical specifications mentioned in RFI Paragraph 6(a)(i) be provided	Yes/No
	(ii) Can ATGM of higher generation, range, penetration and capability than RFI parameters be provided for FICV(Tr)? If yes then give specifications	Yes / No
	(iii) What is the maximum penetration against RHA at 30° after defeating ERA that can be provided	__ mm
	(iv) What accuracy can be achieved by your missile in terrain & temperature conditions as stated in RFI?	__ %

Question	Questionnaire based on RFI for FICV(Tr)						Response		
<p>(v) Provide details as per format given below for your ATGM:-</p>	SNo	Target Range (meters)	Mode of Attack	Max Deviation from Point of Lock on Static Target (CEP) (in mm)	Max Deviation from Point of Lock on Moving Target (CEP) (in mm)	Max Speed to achieve 90% Accuracy			
	Target Speed in Lateral Direction (kmph)	FICV Speed in Direction of Target (kmph)							
	(aa)	500	Direct						
	(ab)	1500	Top						
	(ac)	1500	Direct						
	(ad)	2500	Top						
	(ae)	2500	Direct						
	(af)	4000	Top						
	(ag)	4000	Direct						
	(vi) Does your missile offer Top Attack facility							Yes / No	
(vii) Indicate the max range of your missile in direct mode							__ meters		
(viii) Indicate the minimum range of your missile in direct mode							__ meters		
(ix) Indicate the max range of the missile in Top Attack mode							__ meters		
(x) Indicate the minimum range of the missile in Top Attack mode							__ meters		
(xi) Indicate approx weight of one missile with launch tube							__ kgs		
(xii) Can Sight, GCE & VDU of Main Gun be used for sighting, acquisition & locking of target for Missile.							Yes / No		
(xiii) Can Missile Control Unit be integrated to the FCS of FICV(Tr).							Yes / No		
(xiv) Within how much time should the missile be launched after target is locked by seeker							__ seconds		
(xv) Can missile be re-used in case it is not fired after seeker is locked on target							Yes / No		
(xvi) Can same missile perform anti-tank & anti-personnel/ anti-bunker role							Yes / No		
(xvii) Can different types/ changeable war heads be provided for anti armour & anti personnel role							Yes / No		
(xviii) Can fuze with selectable/ variable detonation be provided on same ATGM							Yes / No		
(xix) Can dual-mode seeker as asked in RFI be provided							Yes / No		

<u>Question</u>	<u>Questionnaire based on RFI for FICV(Tr)</u>	<u>Response</u>
	(xx) Can seeker video be viewed on VDU inside FICV(Tr) from launch till target hit	Yes/No
	(xxi) What type of Guidance System / Mechanism will be provided for ATGM	
	(xxii) Can Training Missiles (without war head/ inert) be provided for training purpose	Yes/No
	(xxiii) Can commander & gunner simultaneously acquire & engage ATGM on two targets in same field of view from respective stations.	Yes / No
	(xxiv) Can commander & gunner simultaneously acquire & engage two different ATGMs on same target from respective stations.	Yes/No
	(xxv) In how much time can the second missile be fired on different / same target in same field of view	__ seconds
	(xxvi) Can Rate of Fire as given in RFI paragraph 6(a) (ii) be achieved for successive ATGMs	Yes / No
	(xxvii) If no then state Rate of Fire that can be achieved for successive ATGMs by your ATGM system	
	(xxviii) Can ATGM be fired from moving FICV(Tr).	Yes / No
	(xxix) Can target / impact point be changed after launch i.e. during flight	Yes/No
	(xxx) Can LOAL be also achieved from same missile	Yes/No
	(xxxii) After launch of missile, can turret be traversed for engaging targets with Main Gun & MG	Yes / No
	(xxxii) How many ready to launch missiles can be provided on each version of FICV(Tr)	__ & __ qty __ & __ qty __ & __ qty
	(xxxiii) Stowage space for how many reserve Guided Missiles be provided inside FICV(Tr)	__ qty
	(xxxiv) Will any mechanical means be provided for loading of reserve missiles on launchers from inside	Yes / No
	(xxxv) What is life expectancy of missile in field conditions without any repair intervention	__ years
	(xxxvi) What is life expectancy of missile in ideal storage conditions without any repair intervention	__ years
	(xxxvii) Additional Technical Details of Guided Missile System that will be installed on FICV(Tr) to be submitted with this response including guidance mechanism, type of seeker (cooled/un-cooled), type of launch (soft or otherwise), type of propellant (solid & smokeless or otherwise) & various types of WarHeads that can be provided in the missile	If available

Question	Questionnaire based on RFI for FICV(Tr)	Response
	<p>(i) Man-Portable Ground Launcher. In your proposal for FICV(Tr):-</p> <p>(i) Will an additional CLU & Sight be required for Man-Portable Ground Launcher</p> <p>(ii) Will on-board Control Unit be dismantled for Ground role</p> <p>(iii) When ATGM firing is being conducted from ground role, can another set of missiles be simultaneously fired from FICV(Tr)</p> <p>(iv) Can Target be locked by Ground Launcher and ATGM mounted on FICV(Tr) be fired remotely to engage the designated target</p> <p>(v) What type of Mounting Unit will be provided (mono, bi-pod or tri-pod)</p> <p>(vi) Will harness for carriage of at least two ATGMs be provided</p> <p>(vii) Weight of man-portable launcher along with Control Unit & Sighting System</p> <p>(vii) Time required by trained crew to convert from vehicle to man-portable mode</p> <p>(ix) Number of persons required to carry one launcher & two missiles</p>	<p>Yes / No</p> <p>Yes / No</p> <p>Yes / No</p> <p>Yes / No</p> <p></p> <p>Yes / No</p> <p>__ kgs</p> <p>__ minutes</p> <p>__ Numbers</p>
4.	<p>(j) Main Gun (at least 30mm Calibre). In your proposal for FICV(Tr):-</p> <p>(i) Can Main Gun as per technical parameters given in RFI be provided</p> <p>(ii) What calibre of Main Gun will be provided / is proposed by you</p> <p>(iii) Will it be possible to provide Main Gun to fire in-service 30mm x 165mm ammunition</p> <p>(iv) Max Elevation of gun in which aimed fire can be achieved</p> <p>(v) Max Depression of gun in which aimed fire can be achieved</p> <p>(vi) Can unlimited 360° traverse of Main Gun be achieved in either directions be provided</p> <p>(vii) What alternate provisions can be provided for laying & firing during failure of main system</p> <p>(viii) Will gunner have access to crew-less turret from inside your FICV(Tr) to manually operate turret, sights & weapons</p> <p>(ix) Max Rate of Fire that can be achieved</p> <p>(x) Will option for Single Shot, Short Burst, Long Burst & Continuous Burst mode be provided</p> <p>(xi) How many rounds of anti-armour (AP), anti-aircraft/personnel (HEF) & anti-field fortification (HE) will be available inside FICV(Tr) in ready to fire mode</p>	<p>Yes / No</p> <p>__mm</p> <p>Yes / No</p> <p>__°</p> <p>__°</p> <p>Yes/No</p> <p></p> <p>Yes / No</p> <p>__rounds per minute</p> <p>Yes / No</p> <p>_ qty AP _ qty HEF _ qty HE</p>

Question	Questionnaire based on RFI for FICV(Tr)					Response																														
	<p>(xii) Mention max accuracy (in percentage) achieved when single round is fired at static tank (NATO Tank Target) from static position for all types of ammunition being offered as per format given below:-</p> <table border="1" data-bbox="510 323 1917 587"> <thead> <tr> <th data-bbox="510 323 618 408">SNo</th> <th data-bbox="618 323 848 408">Type of Ammunition</th> <th data-bbox="848 323 1084 408">Accuracy % at 1000m</th> <th data-bbox="1084 323 1373 408">Accuracy % at 1500m</th> <th data-bbox="1373 323 1637 408">Accuracy % at 2000m</th> <th data-bbox="1637 323 1917 408">Accuracy % at 4000m</th> </tr> </thead> <tbody> <tr> <td data-bbox="510 408 618 453">(aa)</td> <td data-bbox="618 408 848 453">AP</td> <td data-bbox="848 408 1084 453"></td> <td data-bbox="1084 408 1373 453"></td> <td data-bbox="1373 408 1637 453"></td> <td data-bbox="1637 408 1917 453"></td> </tr> <tr> <td data-bbox="510 453 618 497">(ab)</td> <td data-bbox="618 453 848 497">HEF</td> <td data-bbox="848 453 1084 497"></td> <td data-bbox="1084 453 1373 497"></td> <td data-bbox="1373 453 1637 497"></td> <td data-bbox="1637 453 1917 497"></td> </tr> <tr> <td data-bbox="510 497 618 542">(ac)</td> <td data-bbox="618 497 848 542">HE</td> <td data-bbox="848 497 1084 542"></td> <td data-bbox="1084 497 1373 542"></td> <td data-bbox="1373 497 1637 542"></td> <td data-bbox="1637 497 1917 542"></td> </tr> <tr> <td data-bbox="510 542 618 587">(ad)</td> <td data-bbox="618 542 848 587">Others</td> <td data-bbox="848 542 1084 587"></td> <td data-bbox="1084 542 1373 587"></td> <td data-bbox="1373 542 1637 587"></td> <td data-bbox="1637 542 1917 587"></td> </tr> </tbody> </table>					SNo	Type of Ammunition	Accuracy % at 1000m	Accuracy % at 1500m	Accuracy % at 2000m	Accuracy % at 4000m	(aa)	AP					(ab)	HEF					(ac)	HE					(ad)	Others					
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(ab)	HEF																																			
(ac)	HE																																			
(ad)	Others																																			
	(xiii) What is life expectancy of barrel (after how many numbers of AP rounds fired) without any repair intervention / change of parts					__ rounds																														
	(xiv) What is Mean Time Between Failure (MTBF) of barrel & Gun System -					__ rounds																														
	(xv) Can Main Gun can be upgraded to higher calibre at factory level without changing turret, FCS hardware, GCE & Sights. If Yes, then state calibre in mm					Yes/No __ mm																														
	(xvi) Type of Ammunition Feeding System being offered (belted / conveyor / cassette)																																			
	(xvi) Will fired cases be expelled out-side or inside the FICV(Tr)					Out / In side																														
	(xviii) Provide details& technical documents of Main Gun that can be offered in your FICV (Tr) to include ammunition, system of feeding of ammunition and operations.					If available																														
	(k) <u>Ammunition for Main Gun.</u> In your proposal for FICV(Tr):-																																			
	(i) Which ammunition as mentioned in RFI cannot be provided by you																																			
	(ii) What other types of ammunition can be offered for Main Gun																																			
	(iii) Types of Armour Piercing (AP) ammunition that can be provided in your FICV(Tr) as per format given below:-																																			
	<table border="1" data-bbox="510 1155 2123 1289"> <thead> <tr> <th data-bbox="510 1155 618 1240">SNo</th> <th data-bbox="618 1155 848 1240">Type of Ammunition</th> <th data-bbox="848 1155 1294 1240">Penetrate RHA when fired at 60° from 1000m (in mm)</th> <th data-bbox="1294 1155 1583 1240">Min Effective Range(in meters)</th> <th data-bbox="1583 1155 1809 1240">Quantity Ready to Fire</th> <th data-bbox="1809 1155 2123 1240">Total Quantity in FICV(Tr)</th> </tr> </thead> <tbody> <tr> <td data-bbox="510 1240 618 1289">(aa)</td> <td data-bbox="618 1240 848 1289"></td> <td data-bbox="848 1240 1294 1289"></td> <td data-bbox="1294 1240 1583 1289"></td> <td data-bbox="1583 1240 1809 1289"></td> <td data-bbox="1809 1240 2123 1289"></td> </tr> </tbody> </table>					SNo	Type of Ammunition	Penetrate RHA when fired at 60° from 1000m (in mm)	Min Effective Range(in meters)	Quantity Ready to Fire	Total Quantity in FICV(Tr)	(aa)																								
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(aa)																																				

Question	Questionnaire based on RFI for FICV(Tr)					Response	
	(iv) Types of High Explosive (HE) ammunition that can be provided in your FICV(Tr) as per format given below:-						
	SNo	Type of Ammunition	Breach RCC when fired from 1500m (in mm)	Min Effective Range(in meters)	Quantity Ready to Fire	Total Quantity in FICV(Tr)	
	(aa)						
	(v) Can Proximity fuze be provided in HE Amn by you						Yes/No
	(vi) Can FCS controlled Timed Fuze be provided in HE Amn by you						Yes / No
	(vii) Can firer see flight/ trajectory of bullets through sight (Tracer Unit)						Yes / No
	(viii) Cost (less Tax) & life expectancy of ammunition in field conditions & in storage without any repair intervention						
	SNo	Type of Ammunition	Cost Per Round (in ₹)	Life in Field Conditions (in years)	Life in Storage Conditions (in years)		
	(aa)	AP					
	(ab)	HE					
(ac)	HE(Fragmentation)						
(ad)							
4.	(I) Machine Gun (Co-axial). In your proposal for FICV(Tr):-						
(i) Can co-axial Machine Gun (MG) as per technical parameters given in RFI be provided						Yes / No	
(ii) What calibre of MG will be provided / is proposed by you						__mm	
(iii) Will it be possible to provide MG to fire in-service 7.62mm x 54mm rimmed ammunition						Yes / No	
(iii) Will the MG be mounted co-axial to Main Gun						Yes / No	
(iv) Can crew load, cock and unload ammunition in your MG from inside FICV(Tr)						Yes / No	
(v) Can crew manually acquire target and fire MG in case of failure of main electric system						Yes / No	
(vi) Rate of Fire that can be achieved						__ rounds per minute	
(vii) Will option for Single Shot & Continuous Burst mode be provided						Yes / No	
(viii) If above is NO then what modes can be provided							
(ix) How many rounds would be available in ready to fire mode						__rounds	

Question	Questionnaire based on RFI for FICV(Tr)						Response	
	(x) Mention max accuracy (in percentage) that can be achieved when a burst of 10 rounds is fired at static target (10m x10m) as per format given below:-							
	SNo	Type of Ammunition	Accuracy Percentage at					
			100m	500m	1000m	1500m	2000m	
	(aa)							
	(xi) How much penetration on RHA can be achieved by ammunition of the MG when fired from 30m.						__mm	
	(xii) Can firer see flight/ trajectory of bullets through sight (Tracer Unit)						Yes / No	
	(xiii) What alternate provisions will be provided for laying & firing during failure of main system							
	(xiv) What is the life expectancy of barrel (after how many numbers of rounds fired) without any repair intervention / change of parts						__ rounds	
	(xv) What is Mean Time Between Failure (MTBF) of barrel & Gun System -						__ rounds	
	(xvi) Technical Specification. Provide details& technical documents of MG that can be offered in your FICV (Tr) to include system of feeding of ammunition and operation.						if available	
	(m) RCWS with AGS. In your proposal for FICV(Tr):-							
	(i) Can you provide RCWS with integrated sighting system on Turret Roof						Yes / No	
	(ii) What calibre of ammunition will be provided / is proposed by you for AGS						__mm	
	(iii) Can AGS capable of firing in-service ammunition be mounted on RCWS						Yes / No	
	(iv) Can RCWS be used as a flexible mission pod for subsequently installation of additional weapon systems like MG, Smoke Grenade Launchers, Directed Energy Weapons(Laser) etc at factory/ workshop level						Yes / No	
4.	(v) Provide details of weapons that can be fitted on RCWS with changes to weapon mounting only							
	(vi) What arc of fire can be achieved in the RCWS in horizontal plane						__°	
	(vii) Max elevation in which aimed fire can be achieved						__°	
	(viii) Max depression in which aimed fire can be achieved						__°	
	(ix) What will be height of FICV(Tr) with RCWS but without AGS						__ m	
	(x) What type of sights will be integrated with RCWS to enable acquisition and engagement of targets							
	(xi) Will RCWS be integrated to FCS of Main Gun						Yes / No	

Question	Questionnaire based on RFI for FICV(Tr)							Response																																																						
	(xii) Can the crew control RCWS from same Control Unit as that for Main Gun							Yes / No																																																						
	(xiii) Can the crew view image of RCWS sights on same VDU as that for Main Gun							Yes / No																																																						
	(xiv) Qty of AGS ammunition that can be carried in ready to fire mode							___ qty																																																						
	(xv) Qty of AGS ammunition that can be carried in FICV(Tr) as reserve							___ qty																																																						
	(xvi) Can Sighting system of RCWS function as CPS							Yes / No																																																						
	(xvii) Give specifications of Sighting System of RCWS																																																													
	(xviii) Provide details & technical documents of RCWS & AGS that will be offered in your FICV(Tr)							if available																																																						
5.	Fire Control System (FCS). In your proposal for FICV(Tr):-																																																													
	(a) Provide details including Technical Specifications of FCS being offered for FICV(Tr)																																																													
	(b) What sensors will be provided / integrated in your FCS																																																													
	(c) Which Sights & armaments of FICV(Tr) will be integrated to your FCS																																																													
	(d) Which other sub-systems like RCWS, Navigation, Radio, LRF, Ballistic Computer, LWS etc can be integrated to your FCS																																																													
	(e) Which all inputs to your FCS are required to be fed manually																																																													
	(f) Mention Max Accuracy (deviation from point of aim in milli radian) achieved by your FCS as per format given below:-																																																													
	<table border="1"> <thead> <tr> <th data-bbox="421 916 501 1102">SNo</th> <th data-bbox="501 916 680 1102">Type of Armament</th> <th data-bbox="680 916 875 1102">Type of Ammunition</th> <th data-bbox="875 916 1032 1102">Minimum Effective Range</th> <th data-bbox="1032 916 1227 1102">Rate of Fire</th> <th data-bbox="1227 916 1420 1102">Max Accuracy % on Static Target (m rad)</th> <th data-bbox="1420 916 1628 1102">Max Accuracy % on Moving Target (m rad)</th> <th colspan="2" data-bbox="1628 916 2136 991">Max Speed to achieve Max Accuracy</th> </tr> <tr> <td colspan="7"></td> <th data-bbox="1628 991 1899 1102">Target Speed in Lateral Direction (kmph)</th> <th data-bbox="1899 991 2136 1102">FICV Speed in Direction of Target (kmph)</th> </tr> </thead> <tbody> <tr> <td data-bbox="421 1102 501 1142">(i)</td> <td data-bbox="501 1102 680 1142">Main Gun</td> <td data-bbox="680 1102 875 1142">AP</td> <td data-bbox="875 1102 1032 1142">1500m</td> <td data-bbox="1032 1102 1227 1142">Single Shot</td> <td data-bbox="1227 1102 1420 1142"></td> <td data-bbox="1420 1102 1628 1142"></td> <td data-bbox="1628 1102 1899 1142"></td> <td data-bbox="1899 1102 2136 1142"></td> </tr> <tr> <td data-bbox="421 1142 501 1182">(ii)</td> <td data-bbox="501 1142 680 1182">Main Gun</td> <td data-bbox="680 1142 875 1182">HE</td> <td data-bbox="875 1142 1032 1182">4000 m</td> <td data-bbox="1032 1142 1227 1182">Single Shot</td> <td data-bbox="1227 1142 1420 1182"></td> <td data-bbox="1420 1142 1628 1182"></td> <td data-bbox="1628 1142 1899 1182"></td> <td data-bbox="1899 1142 2136 1182"></td> </tr> <tr> <td data-bbox="421 1182 501 1222">(iii)</td> <td data-bbox="501 1182 680 1222">MG</td> <td data-bbox="680 1182 875 1222">AP</td> <td data-bbox="875 1182 1032 1222">2000m</td> <td data-bbox="1032 1182 1227 1222">Burst</td> <td data-bbox="1227 1182 1420 1222"></td> <td data-bbox="1420 1182 1628 1222"></td> <td data-bbox="1628 1182 1899 1222"></td> <td data-bbox="1899 1182 2136 1222"></td> </tr> <tr> <td data-bbox="421 1222 501 1259">(iv)</td> <td data-bbox="501 1222 680 1259">AGS</td> <td data-bbox="680 1222 875 1259">HE</td> <td data-bbox="875 1222 1032 1259">1500m</td> <td data-bbox="1032 1222 1227 1259">Single Shot</td> <td data-bbox="1227 1222 1420 1259"></td> <td data-bbox="1420 1222 1628 1259"></td> <td data-bbox="1628 1222 1899 1259"></td> <td data-bbox="1899 1222 2136 1259"></td> </tr> </tbody> </table>								SNo	Type of Armament	Type of Ammunition	Minimum Effective Range	Rate of Fire	Max Accuracy % on Static Target (m rad)	Max Accuracy % on Moving Target (m rad)	Max Speed to achieve Max Accuracy									Target Speed in Lateral Direction (kmph)	FICV Speed in Direction of Target (kmph)	(i)	Main Gun	AP	1500m	Single Shot					(ii)	Main Gun	HE	4000 m	Single Shot					(iii)	MG	AP	2000m	Burst					(iv)	AGS	HE	1500m	Single Shot				
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<u>Question</u>	<u>Questionnaire based on RFI for FICV(Tr)</u>	<u>Response</u>																					
	<p>(g) LRF. What are accuracy parameters of the Laser Range Finders (LRFs):-</p> <table border="1" data-bbox="566 280 1386 603"> <thead> <tr> <th data-bbox="566 280 685 371">SNo</th> <th data-bbox="685 280 1005 371">Target Range (in meters)</th> <th data-bbox="1005 280 1386 371">Max Error (in meters)</th> </tr> </thead> <tbody> <tr> <td data-bbox="566 371 685 411">(aa)</td> <td data-bbox="685 371 1005 411">400</td> <td data-bbox="1005 371 1386 411"></td> </tr> <tr> <td data-bbox="566 411 685 451">(ab)</td> <td data-bbox="685 411 1005 451">1000</td> <td data-bbox="1005 411 1386 451"></td> </tr> <tr> <td data-bbox="566 451 685 491">(ac)</td> <td data-bbox="685 451 1005 491">2000</td> <td data-bbox="1005 451 1386 491"></td> </tr> <tr> <td data-bbox="566 491 685 531">(ac)</td> <td data-bbox="685 491 1005 531">4000</td> <td data-bbox="1005 491 1386 531"></td> </tr> <tr> <td data-bbox="566 531 685 571">(ad)</td> <td data-bbox="685 531 1005 571">7000</td> <td data-bbox="1005 531 1386 571"></td> </tr> <tr> <td data-bbox="566 571 685 603">(ae)</td> <td data-bbox="685 571 1005 603">10000</td> <td data-bbox="1005 571 1386 603"></td> </tr> </tbody> </table>	SNo	Target Range (in meters)	Max Error (in meters)	(aa)	400		(ab)	1000		(ac)	2000		(ac)	4000		(ad)	7000		(ae)	10000		
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(ac)	4000																						
(ad)	7000																						
(ae)	10000																						
	(h) Will LRF be integrated with the sighting system	Yes / No																					
	(i) <u>Miscellaneous Features of FCS</u>																						
	(i) Can your FCS calculate location coordinates of target pointed by LRF	Yes / No																					
	(ii) Can your FCS enable Commander to view image of Gunner's Sight and vice-versa	Yes / No																					
	(iii) Can your FCS enable Commander to override controls of Gun, MG, Missiles & RCWS	Yes / No																					
	(iv) Can your FCS enable Commander to designate & handover target to Gunner	Yes / No																					
	(v) What combination of weapons can be fired simultaneously by Gunner & Commander	Yes / No																					
	(vi) Can an IFF system based on Artificial Intelligence be provided as an inbuilt facility of FCS	Yes / No																					
	(vii) Can your FCS automatically & remotely collect, collate & display location of all neighbouring FICV(Tr) vehicles	Yes / No																					
	(viii) Can your FCS integrate Situational Awareness System being provided for Commander	Yes / No																					
	(ix) What additional facilities can be provided by your FCS																						
6.	<u>Gun Control Equipment (GCE).</u> In your proposal for FICV(Tr):-																						
	(a) Provide technical details of GCE system including Control Unit being offered for FICV(Tr)	If available																					

<u>Question</u>	<u>Questionnaire based on RFI for FICV(Tr)</u>					<u>Response</u>
	(b) Maximum elevation & depression that can be achieved for following armaments:-					
	SNo	Armament	Max Elevation with Aimed Fire (in degree)	Max Possible Elevation of Sights (in degree)	Max Depression with Aimed Fire (in degree)	Max Possible Depression of Sights (in degree)
	(i)	Main Gun				
	(ii)	MG				
	(iii)	Guided Missile				
	(iv)	RCWS				
	(c) Can Turret be traversed 360° unlimited times in either directions					Yes / No
	(d) Speed of traverse of the turret that can be achieved:- (i) Max Speed: ___° per second. (ii) Min Speed: ___° per second.					
	(e) Speed of elevation of the main gun that can be achieved:- (i) Max Speed: ___° per second. (ii) Min Speed: ___° per second.					
	(f) Speed of depression of the main gun that can be achieved:- (i) Max Speed: ___° per second. (ii) Min Speed: ___° per second.					
	(g) What mechanism/ device will be provided for traversing Turret & elevation/depression of Main Gun by user					
	(h) Can RCWS be also controlled using traverse & elevation mechanism/ device of Main Gun					Yes / No
	(i) Can Fine and Coarse laying of armaments be possible					Yes / No
	(j) How much fine laying (in degrees/ Mills) can be achieved with power traverse & power elevation					___°
	(k) Can variable speed of traverse of Turret and elevation/depression of Main Gun be achieved by user					Yes / No
	(l) What system will be provided for achieving stability of Main Gun, MG, RCWS & ATGM Launcher when FICV(Tr) is moving in stated terrain					
	(m) Will command for firing of all weapons be given from a common switch / button					Yes / No
	(n) Will firing button be integrated to GCE (Control Unit)					Yes / No
	(o) Will alternate system for traversing of turret & elevation / depression of Main Gun & Missiles be provided in					Yes / No

Question	Questionnaire based on RFI for FICV(Tr)										Response																																																																												
	case of failure of main electric circuit of GCE																																																																																						
	(p) Will alternate system for firing all weapons be provided in case of failure of main electric circuit of GCE										Yes / No																																																																												
	(q) Will an ergonomic Control Unit with ease of operation, minimal hand movement and physical perception of switches/controls without actual need of seeing them be provided										Yes / No																																																																												
7.	Vision & Surveillance Devices. In your proposal for FICV(Tr):-																																																																																						
	(a) Give out details of electronic / optical sights being provided as per format given below :-																																																																																						
	<table border="1" data-bbox="470 507 2094 898"> <thead> <tr> <th data-bbox="470 507 683 715" rowspan="4">Sight</th> <th colspan="4" data-bbox="683 507 1153 547">Sight Specifications</th> <th colspan="4" data-bbox="1153 507 1579 627">Max Range of Detection/Recognition/ Identification</th> <th colspan="2" data-bbox="1579 507 1877 627">Type of Image / Video Output</th> <th data-bbox="1877 507 2094 627" rowspan="4">Stabilised in Plane (2D/ 3D)</th> </tr> <tr> <th colspan="2" data-bbox="683 547 884 627">Type</th> <th colspan="2" data-bbox="884 547 1153 627">Fd of View (in degrees)</th> <th colspan="2" data-bbox="1153 627 1355 715">Tank</th> <th colspan="2" data-bbox="1355 627 1579 715">Personnel</th> <th data-bbox="1579 627 1691 715">Day</th> <th data-bbox="1691 627 1877 715">TI</th> </tr> <tr> <th data-bbox="683 627 772 715">Day</th> <th data-bbox="772 627 884 715">Night</th> <th data-bbox="884 627 996 715">Wide</th> <th data-bbox="996 627 1153 715">Narrow</th> <th data-bbox="1153 715 1243 786">Day</th> <th data-bbox="1243 715 1355 786">TI</th> <th data-bbox="1355 715 1444 786">Day</th> <th data-bbox="1444 715 1579 786">TI</th> <th data-bbox="1579 715 1691 786">Day</th> <th data-bbox="1691 715 1877 786">TI</th> </tr> <tr> <td data-bbox="470 715 683 754">Driver</td> <td></td> <td></td> <td>—°</td> <td>—°</td> <td></td> <td></td> <td></td> <td></td> <td></td> <td></td> </tr> <tr> <td data-bbox="470 754 683 810">Commander</td> <td></td> <td></td> <td>—°</td> <td>—°</td> <td></td> <td></td> <td></td> <td></td> <td></td> <td></td> </tr> <tr> <td data-bbox="470 810 683 866">Gunner</td> <td></td> <td></td> <td>—°</td> <td>—°</td> <td></td> <td></td> <td></td> <td></td> <td></td> <td></td> </tr> <tr> <td data-bbox="470 866 683 898">RCWS Sight</td> <td></td> <td></td> <td>—°</td> <td>—°</td> <td></td> <td></td> <td></td> <td></td> <td></td> <td></td> </tr> </thead></table>											Sight	Sight Specifications				Max Range of Detection/Recognition/ Identification				Type of Image / Video Output		Stabilised in Plane (2D/ 3D)	Type		Fd of View (in degrees)		Tank		Personnel		Day	TI	Day	Night	Wide	Narrow	Day	TI	Day	TI	Day	TI	Driver			—°	—°							Commander			—°	—°							Gunner			—°	—°							RCWS Sight			—°	—°						
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	(b) Optical Vision Devices / Periscopes. In your proposal for FICV(Tr):-																																																																																						
	(i) Details including Technical Specifications of various Optical Vision Devices / Periscopes being provided to crew & stick and their proposed numbers & location in your FICV(Tr)										If available																																																																												
	(ii) What is the horizontal & vertical field of view of each type of periscope that can be provided by you										_° & _°																																																																												
	(iii) Do all optical sights & periscopes meet IP-65 standard for protection under water, dust & moisture.										Yes / No																																																																												
	(iv) Will all optical sights including periscopes have facility for de-fogging & self cleaning										Yes / No																																																																												
	(c) Driver's Sight. In your proposal for FICV(Tr):-																																																																																						
	(i) Can driver use one common sight to drive FICV(Tr) in all terrain and light conditions										Yes / No																																																																												
	(ii) Can driver use same sight during amphibious / floatation role										Yes / No																																																																												
	(iii) By what means/ device is image / video from Sight displayed to Driver																																																																																						
	(iv) How is image stabilisation achieved in the sight																																																																																						
	(v) What generation of TI is being provided																																																																																						

<u>Question</u>	<u>Questionnaire based on RFI for FICV(Tr)</u>	<u>Response</u>
	(vi) Is TI sight based on cooled or un-cooled technology	
	(vii) What is the lateral field of view that the sight can provide	___°
	(viii) What is the vertical field of view that the sight can provide	___°
	(ix) What provisions will be given to assist driver in accurate/ precise driving of FICV(Tr)	
	(x) Is it feasible to move sight in horizontal & vertical plain	Yes / No
	(xi) Can coloured light be seen during night time ie is image fusion of Day & TI feasible	Yes / No
	(xii) Can driver get day & TI image of rear side of the vehicle	Yes / No
	(xiii) Can 360° situational awareness around FICV(Tr) be provided to driver	Yes / No
	(xiv) Will sight be integrated with FCS / On-board computer for data/ functions like navigation, tactical, communication, terrain information, vehicle performance / diagnostic data etc.	Yes / No
	(xv) Will common VDU be provided for front view, rear view, navigation etc	Yes / No
	(xvi) Provide details including technical specifications of driver sight that will be provided for FICV(Tr)	If available
7.	(d) <u>Gunner Sight (GMS) & Commander Sights (CPS)</u> . In your proposal for FICV(Tr):-	
	(i) Will sights with same optical specifications (D-R-I) be provided for commander & gunner	Yes / No
	(ii) Can CPS be elevated & traversed independent to the turret	Yes / No
	(iii) Can CPS be independently elevated & traversed using same device/ mechanism used for movement of Main Gun	Yes / No
	(iv) How much angle of elevation and traverse is feasible for CPS in your FICV(Tr)	__° & __°
	(v) What type of image stabilisation will be provided in both sights	
	(vi) What generation of TI and cooling system is being provided for sights	
	(vii) By what device is image / video from GMS & CPS is displayed to user	
	(viii) Can sight video be saved for future reference	Yes / No
	(ix) Can reticules for fine laying and aimed firing be provided in GMS & CPS	Yes / No
	(x) Can coloured light be seen during night time ie is image fusion of Day & TI feasible	Yes / No
	(xi) Will both sights be fully integrated with FCS	Yes / No
	(xii) How much max length can CPS be remotely elevated over the turret for surveillance	
	(xiii) Is it feasible to bring aimed fire on targets when CPS is elevated	Yes / No

<u>Question</u>	<u>Questionnaire based on RFI for FICV(Tr)</u>					<u>Response</u>
	in correlation to the direction of his head					
	(vi) Can display of commander be superimposed / over laid on VDUs used by other crew members and inside Stick Compartment.					Yes / No
9.	Protection. Provide details of protection being provided in your proposal for FICV(Tr) under following heads:-					
	(a) Armour Protection Levels.					
	(i) Please provide details of Armour Protection Levels that can be offered:-					
	Ser No	Vehicle Arc	STANAG Protection achieved using Integral Armour	Max STANAG Protection provided using Additional & Removable Modular Armour	Max STANAG Protection that can be offered while retaining Amphibious Capability	Can Indigenous Material be Used
	(aa)	Front 120° Arc including turret				Yes / No
	(ab)	Sides				Yes / No
	(ac)	Top (incl Turret Top)				Yes / No
	(ad)	Rear				Yes / No
	(ae)	Belly				Yes / No
	(af)	Glasses				Yes / No
	(ii) How much % of de-rating in vehicle performance will occur on fitment of Additional Add-on Armour					___ %
	(iii) With Add-on Armour for STANAG-6 level protection, will FICV(Tr) be able to perform amphibious tasks mentioned in RFI					Yes / No
	(iv) Will it be feasible to fix Additional Add-on Armour on FICV(Tr) by crew in field conditions					Yes / No
	(v) Will special tools/ equipment be required for fixing / removing add-on armour on FICV(Tr)					Yes / No
	(vi) Can double layer be provided for hull floor for added protection against under belly blast					Yes / No
	(b) Laser Warning System (LWS). Provide details of LWS that can be offered in your FICV(Tr):-					
	(i) Can your LWS be integrated to the FCS.					Yes / No
	(ii) Can all round (360° hemispherical) protection be provided by your LWS.					Yes / No
	(iii) What kinds of lasers will be detected by your system.					
	(iv) Will audio & visual warning to crew be provided on detection of laser.					Yes / No

Question	Questionnaire based on RFI for FICV(Tr)	Response																								
	(v) What counter measures can be initiated in your system. (vi) Can on board armament of FICV(Tr) be automatically pointed and fired to the laser source. (vii) Can in-service 81mm ATAL smoke grenades be used for generating smoke screen (viii) After how many laser attacks will your system require replacement of smoke canisters. (ix) Can smoke shells / canisters of LWS be fired manually in desired direction by the crew (x) What is the dimension of smoke screen that is achieved on firing of one set of grenades	 Yes / No Yes / No ___ qty Yes / No ___m x ___m																								
9.	(c) Active Protection System (APS) . Provide details of APS that can be offered in your FICV(Tr):- (i) Give Technical Specifications & concept of your APS. (ii) Your APS can effectively counter which kind / speed of ammunition/ projectile (iii) What % of protection is offered is offered by your APS against <table border="1" data-bbox="539 751 1711 1102"> <thead> <tr> <th data-bbox="539 751 669 791">SN</th> <th data-bbox="669 751 1191 791">Type of Projectile</th> <th data-bbox="1191 751 1711 791">% of Protection</th> </tr> </thead> <tbody> <tr> <td data-bbox="539 791 669 831">(aa)</td> <td data-bbox="669 791 1191 831">ATGM (Direct Attack)</td> <td data-bbox="1191 791 1711 831"></td> </tr> <tr> <td data-bbox="539 831 669 871">(ab)</td> <td data-bbox="669 831 1191 871">ATGM (Top Attack)</td> <td data-bbox="1191 831 1711 871"></td> </tr> <tr> <td data-bbox="539 871 669 911">(ac)</td> <td data-bbox="669 871 1191 911">Loiter Munition/ Drone</td> <td data-bbox="1191 871 1711 911"></td> </tr> <tr> <td data-bbox="539 911 669 951">(ad)</td> <td data-bbox="669 911 1191 951">RPG</td> <td data-bbox="1191 911 1711 951"></td> </tr> <tr> <td data-bbox="539 951 669 991">(ae)</td> <td data-bbox="669 951 1191 991">HEAT</td> <td data-bbox="1191 951 1711 991"></td> </tr> <tr> <td data-bbox="539 991 669 1031">(af)</td> <td data-bbox="669 991 1191 1031">APFSDS</td> <td data-bbox="1191 991 1711 1031"></td> </tr> <tr> <td data-bbox="539 1031 669 1102">(ag)</td> <td data-bbox="669 1031 1191 1102">30mm AP round</td> <td data-bbox="1191 1031 1711 1102"></td> </tr> </tbody> </table> (iv) Can your APS also do functions of LWS (v) Your APS counters incoming projectile at what distance from FICV(Tr) (vi) When APS is initiated, what is the Danger Zone for dismounted troops in vicinity of FICV(Tr) (vii) How many simultaneous attacks can your APS counter (viii) After how many attacks will your APS require re-charging / replacement of explosive (ix) Can all round (360° hemispherical) protection be provided by your APS. (x) Is it feasible to program specific direction/ arc of protection. (xi) Time till which APS can function / remain active continuously	SN	Type of Projectile	% of Protection	(aa)	ATGM (Direct Attack)		(ab)	ATGM (Top Attack)		(ac)	Loiter Munition/ Drone		(ad)	RPG		(ae)	HEAT		(af)	APFSDS		(ag)	30mm AP round		 If available Yes / No ___ m ___ m Yes / No Yes / No ___ hrs
SN	Type of Projectile	% of Protection																								
(aa)	ATGM (Direct Attack)																									
(ab)	ATGM (Top Attack)																									
(ac)	Loiter Munition/ Drone																									
(ad)	RPG																									
(ae)	HEAT																									
(af)	APFSDS																									
(ag)	30mm AP round																									

Question	Questionnaire based on RFI for FICV(Tr)	Response
	(d) Spall Liners. Provide details of Spall Liners that can be offered in your FICV(Tr):-	
	(i) What will be the material used as spall liners	
	(ii) Can protection from roof fragments be provided	Yes / No
	(e) CBRN Protection System. Provide details of CBRN Protection System that can be offered in your FICV(Tr):-	
	(i) Specify minimum detection time for Chemical Agents & Nuclear Radiations	
	(ii) How much time is required for protection to be effective	
	(iii) What is the duration for which protection is offered	
	(iv) Can vehicle be driven after activation of CBRN protection	Yes / No
	(v) Which vehicle systems cannot be used once CBRN protection is switched on	
	(vi) Which armament cannot be used once CBRN protection is switched on	
	(vii) Can CBRN protection be activated automatically on detection	Yes / No
	(viii) Can Mini-UAV & Loiter Munition be launched once CBRN protection is switched on	Yes / No
	(ix) What is the concept of CBRN protection being offered to personnel & equipment inside FICV(Tr)	
	(x) In case over-pressure system is being provided, how will over-pressure be achieved inside	
	(xi) What equipment for decontamination of vehicle & personnel will be provided inside FICV(Tr)	
	(f) Water Protection. Provide details of Protection from water that can be offered in your FICV(Tr):-	
	(i) Are all sights, sensors & sub systems which are mounted on the exterior of FICV(TR) water, moisture and dust proof	Yes / No
	(ii) Any restriction / limit in terms of time of continuous exposure to water after which water proofing is likely to fail	Yes / No
	(iii) Will water proofing be applicable for sea/ saline water also	Yes / No
	(iv) Will any water enter into FICV(Tr) when all hatches / doors are shut	Yes / No
	(v) In case there is ingress of water, will a system be provided for motorised extraction/ pumping of water to ensure FICV(TR) remains afloat and all systems are functional	Yes / No
	(vi) Will all optical sights achieve minimum IP-65 protection standard against water, moisture & dust	Yes / No
	(g) Protection Against Fire. Provide details of Protection against Fire/ Flame that can be offered in your FICV(Tr):-	
	(i) Can in-service IFDSS system be integrated	Yes / No

<u>Question</u>	<u>Questionnaire based on RFI for FICV(Tr)</u>	<u>Response</u>
	(ii) How fast can flame & fire inside FICV(Tr) be detected	_ millisec
	(iii) What types of fire can be detected & suppressed	
	(iv) Can the system also detect smoke & give warning	Yes / No
	(v) Can it suppress fire caused inside vehicle as a result of hit by a projectile?	Yes / No
	(vi) Can flame / fire be automatically extinguished in all locations inside FICV(Tr)	Yes / No
	(vii) Areas that are not covered for flame / fire detection and/or suppression	
	(viii) Can Manual Fire Extinguishers for extinguishing all types of fire be provided	Yes / No
	(ix) Type of gas/ chemical used for fire suppression in manual and automatic bottles.	
	(x) How many fires incidents can be handled by system before bottle refilling will be required	
	(xi) Can fire extinguishing gas / chemical be re-filled by crew in field conditions	Yes / No
	(xii) <u>Passive Measures</u> . Can fire resistant/ retardant material be used on surface of all internal & external systems, sub-systems & parts of FICV(Tr) including fabric, plastic, rubber etc	Yes / No
10.	<u>Communication</u> . Please provide details of Communication System that can be offered in your FICV(Tr):-	
	(a) Can 'In-Service' Radio Sets (BNE) be provided in FICV(Tr) as per qty mentioned in RFI	Yes / No
	(b) If no then give details of Radio Sets that will be provided	
	(c) Will the controls of all Radio Sets be within arms reach of commander	Yes / No
	(d) Will a headgear with hands-free and cordless microphones & ear phones be provided to all users	Yes / No
	(e) After wearing headgear, will crew be able to communicate with own FICV(Tr) even when dismounted upto at least 20m	Yes / No
	(f) Will 01 x light weight, helmet mounted, hands-free VHF radio set of at least 1000m range for Stick Commander be provided for communication with FICV(Tr) Commander / other out-stations having similar sets when dismounted.	Yes / No
	(g) Can DCH as per RFI be provided? If not, give details of what alternate solution will be provided	Yes / No
	(h) Can OFC be provided as media for interconnecting communication equipment & data within FICV(Tr)	Yes / No
	(i) Can wireless media be provided for interconnecting communication equipment & data within FICV(Tr)	Yes / No
	(j) Will antenna bases be provided to mount antenna of in-service radio sets	Yes / No
	(k) Will antennas of Radio Sets prevent 360° movement of Main Gun	Yes / No

<u>Question</u>	<u>Questionnaire based on RFI for FICV(Tr)</u>	<u>Response</u>
11.	<p><u>Navigation System.</u> Provide details of Navigation System that can be offered in your FICV(Tr):-</p> <p>(a) Can in-service navigation system as per RFI be provided?</p> <p>(b) If not then provide capability of navigation system being installed</p> <p>(c) Is your navigation equipment compatible to IRNS & DSM</p> <p>(d) Can instructions/ data be fed into navigation system through voice commands</p> <p>(e) Can driver and crew commander input independent navigation data / instructions</p> <p>(f) Can navigation data including route be displayed / overlaid in form of user friendly symbols / text on existing VDUs of Driver, GMS, CPS and Stick Commander</p> <p>(g) Can Crew Commander observe navigation screen of the driver</p> <p>(h) Can Navigation System be integrated with FCS so that turret and RCWS can be automatically aligned towards a marked position on map or location data received from forward troops / Mini-UAV</p> <p>(i) Can Navigation System be integrated with the communication system so that navigation data be digitally marked using Artificial Intelligence and be transmitted to and received from other FICV(Tr) vehicles</p>	<p>Yes / No</p> <p></p> <p>Yes / No</p>
12.	<p><u>Miscellaneous Technical Specifications.</u> Provide details of following that can be offered in your FICV(Tr):-</p> <p>(a) <u>Sub-systems & Assemblies.</u></p> <p>(i) Which systems & sub-systems would be modular with easy accessibility to ensure quick replacement of faulty modules/sub assemblies</p> <p>(ii) Can all instructions/ markings inside FICV(Tr), manuals and literature be provided in English & Hindi language</p> <p>(b) <u>Temperature Control System.</u></p> <p>(i) Give technical specifications to include power consumption and performance parameters</p> <p>(ii) Will desired temperature at ambient temperature ranges mentioned in RFI be provided</p> <p>(iii) Will facility for spot cooling / heating of critical electronic components / medicines be provided</p> <p>(iv) Will the System be dependent on power / drive from Main Engine of FICV(Tr)</p> <p>(v) What will be the source of electric & mechanical power for functioning of the System</p> <p>(vi) Will the System function when CBRN / Amphibious mode is switched on</p>	<p></p> <p>Yes / No</p> <p></p> <p>If available</p> <p>Yes / No</p> <p>Yes / No</p> <p>Yes / No</p> <p></p> <p>Yes / No</p>

<u>Question</u>	<u>Questionnaire based on RFI for FICV(Tr)</u>	<u>Response</u>
	(vii) Give out max & min ambient temperatures under which ECU will provide desired temperatures	_° & _°
	(viii) Indicate maximum duration of continuous operation of Temperature Control System	__ minutes
	(ix) Can Temperature Control Unit function on APU of FICV(Tr)	Yes / No
	(c) <u>APU for Power Backup.</u>	
	(i) What technology will be used to provide Silent Power Back-up as per RFI requirement	
	(ii) Please provide Technical Specifications of your APU	if available
	(iii) Will power backup ensure seamless working of all on board optical, electrical and weapon systems as defined in RFI when engine is switched off	Yes / No
	(iv) What maximum duration of power backup can be provided	__ minutes
	(v) What will be the type of fuel (if any) required for power backup system	
	(vi) Once full power backup is utilised, in how much time can the power back-up be restored	__ minutes
	(vii) Which all systems as defined in RFI cannot be provided power from your APU	
	(viii) How much power back up can be provided by Vehicle Main Battery provide in absence of APU for the parameters mentioned in RFI Appx A para 11(c)	__ minutes
	(ix) What maximum duration of power backup can be provided in Gun Version from Vehicle Battery	__ minutes
	(d) <u>Ergonomics.</u>	
	(i) How much leg-room will be provided to each crew and stick (in mm)	__ mm
	(ii) What will be the orientation for each crew & stick member while seated in relation to front	
	(iii) What ergonomic comforts / facilities will be provided to crew & stick facilitate 72 hours continuous seating under operational conditions -	
	(e) <u>Seats.</u>	
	(i) Can height adjustable seats with head rest be provided for crew & sticks	Yes / No
	(ii) Can blast attenuating cushioned seats with shock dampeners be provided for all	Yes / No
	(iii) What type of seat belts will be provided to ensure comfort & safety	
	(f) <u>Entry/Exit for Crew and Stick.</u>	
	(i) Can individual hatches be provided for entry/exit of each crew	Yes / No
	(ii) How many roof hatches are being provided for entry/exit for Stick	__Numbers

<u>Question</u>	<u>Questionnaire based on RFI for FICV(Tr)</u>	<u>Response</u>
	(iii) Type & Qty of door is being provided on the rear hull wall for entry / exit of the Stick	
	(iv) Can this door function as a ramp for ease of entry / exit of Stick	Yes / No
	(v) Can this door / ramp be electrically and manually operated	Yes / No
	(vi) Can this door be remotely opened by the Commander & Driver	Yes / No
	(vii) Can this door be operated from outside the FICV(Tr)	Yes / No
	(viii) Will facility be provided to manually/ mechanically operate rear door/ramp during electrical failure	Yes / No
	(ix) Can a hatch be provided for entry / exit of crew from Turret	Yes / No
	(g) <u>Stowage Facility.</u>	
	(i) Can dedicated, customised, modular & directly accessible stowage facility be provided inside FICV(Tr) for personal weapons, ammunition, reserve missiles, first-aid kits and combat equipment of crew and stick.	Yes / No
	(ii) Can space for storage of two reserve missiles be provided inside FICV(Tr).	Yes / No
	(iii) Can dedicated, customised, modular & directly accessible external stowage facility be provided on FICV(Tr) for camouflage net (BFE), outer protective cover for vehicle and outdoor shelters for crew & stick	Yes / No
	(iv) How and where will stowage for Spares Parts, Tools and Accessories (SPTA) be located	
	(h) <u>Ammunition Loading.</u>	
	(i) At which location inside FICV(Tr) is ready to fire and reserve ammunition for Main Gun, MG, AGS, ATGM & Loiter Munition will be stored	
	(ii) What system is being provided for loading/unloading of ammunition into magazines / launchers	
	(iii) Can mechanical / electrical means to assist fast & safe loading/unloading of ammunition including missiles will be provided	Yes / No
	(i) <u>Firing Port Hole</u>	
	(i) Can you provide firing port hole as asked in the RFI.	Yes / No
	(ii) If No then what is your recommendation for firing of pers weapon of the stick from inside FICV(Tr).	

<u>Question</u>	<u>Questionnaire based on RFI for FICV(Tr)</u>	<u>Response</u>
(j)	<u>Water Storage.</u>	
	(i) Can system of drinking water as per RFI be provided	Yes / No
	(ii) Number of water tanks with their capacity and location that can be provided in FICV(Tr)	
	(iii) What quantity of drinking water will be available in FICV(Tr) for direct access by crew & stick	___ litres
	(iv) Can dedicated water dispenser (tap) for each crew station & Stick Compartments be provided	Yes / No
	(v) Can a system of generating drinking water from atmosphere / vehicle systems / Temperature Control Unit/ artificial means be provided in FICV(Tr)	Yes / No
	(vi) Can food grade material be used for inner layer of water tanks and plumbings	Yes / No
	(vii) Can removable water tanks be provided	Yes / No
	(viii) Can facility for manually replacing empty tanks with filled ones in quick time-frame without need of any special tools be provided	Yes / No
	(ix) Can facility to drain water for cleaning tank be provided	Yes / No
	(x) Can inlets for quick filling of water in tanks be provided	Yes / No
(k)	<u>Tow Hooks.</u>	
	(i) Can Tow Hooks as per RFI be provided	Yes / No
	(ii) At which location on hull will tow hooks be provided for recovery of FICV(Tr)	
	(iii) How many tow hooks will be provided on each side	
	(iv) Can hooks be provided for attaching parachute chords for air-dropping of FICV(Tr)	Yes / No
	(v) How many Tow-Ropes will be provided on FICV(Tr) for recovery	
	(vi) Hoisting Hooks for mechanical removal of which major assemblies will be provided	
(l)	<u>Contour Lights.</u>	
	(i) Can Contour Lights as per RFI be provided	Yes / No
	(ii) At which location will Contour Lights be provided	
	(iii) Will facility to individually control brightness, blink / static be provided	Yes / No
	(iv) Will facility to individually change colour (red, amber, green & white) be provided	Yes / No
(m)	<u>Crew Shelters.</u>	
	(i) Can fire resistant water proof cover for FICV(Tr) be provided	Yes / No

Question	Questionnaire based on RFI for FICV(Tr)	Response
	(ii) Can fire resistant water proof shelter for crew & sticks be provided	Yes / No
	(iii) Can FICV(Tr) cover be converted as independent shelter for the Crew & Stick	Yes / No
	(iv) Can stowage space for shelter be provided on FICV(Tr)	Yes / No
	(n) <u>Paint.</u>	
	(i) Can FICV(Tr) be painted in terrain specific camouflaged pattern as per users requirement	Yes / No
	(ii) Can Anti-IR Paint be provided	Yes / No
	(o) <u>Reliability.</u> What will be the Maximum Mean Time Between Failures of under mentioned systems:-	
	(i) Automotive Systems (in hrs)	__ hrs
	(ii) Armament Systems (No of APFSDS-T rounds)	__ rounds
	(iii) Electrical Assemblies / sub assemblies (in hrs)	__ hrs
	(iv) Day / TI sights (in hrs)	__ hrs
	(v) VDUs	__ hrs
	(p) <u>Maintainability.</u>	
	(i) Will modular systems to enable quick replacements & repairs at field workshop level be provided	Yes / No
	(ii) Will MToT as per DAP for sustenance of FICV(TR) be provided	Yes / No
	(iii) Will MRO philosophy be aligned to levels of repairs as per DAP & as sought in RFI	Yes / No
	(iv) What is your MRO philosophy	
	(v) Please provide details of repairs which can be undertaken at following levels:-	
	(aa) Unit (Organizational 1 (O1) Level.	If available
	(ab) Field (Organizational 2 (O2) Level.	If available
	(ac) Intermediate (I) Level.	If available
	(ad) Base (Depot (D)) Level.	If available
	(vi) Will you provide 'Engineering Support Package (ESP)' for lifetime sustenance of equipment for various echelons of repairs to include following :-	
	(aa) Special Machine Tools (SMT) for maintenance and repair related tasks	Yes / No
	(ab) Special Test Equipment /Test Jigs for diagnostics to support maintenance & repair tasks	Yes / No
	(ac) Inspection gauges to check serviceability standards/ tolerances	Yes / No

<u>Question</u>	<u>Questionnaire based on RFI for FICV(Tr)</u>	<u>Response</u>
	(ad) Spares, to include sub-assemblies as well as spares for Component Level Repairs (CLR)	Yes / No
	(ae) Technical Literature to include Illustrated Spare Part List (ISPL) and manuals covering all aspects related to operation, maintenance, diagnostics and repair at various echelons	Yes / No
	(af) Training aggregates/aids for operator, quality assurance & maintenance personnel	Yes / No
	(ag) Inspection standards to ascertain serviceability of equipment as well as its modules/ components	Yes / No
	(ah) Are you willing to undertake Annual Maintenance Contract (AMC) for the Special Test Equipment (STEs)? If yes, what is the indicative cost in terms of percentage of cost of Special Test Equipment (STEs)	Yes / No ____%
	(vii) What Class of Interactive Electronic Technical Manual (IETM) will be provided by you for technical literature mentioned above	
	(viii) Can class room trainer & Computer/AR/VR based Training Packages for Maintenance Personnel be provided	Yes / No
	(ix) Is there a requirement of periodic calibration of any Special Machine Tools/ Special Test Equipment's (SMTs/ STEs)/ Gauges (Ground Support Equipment (GSE)/ Ground Handling Equipment (GHE)/ Bay Servicing Equipment (BSE) to be also included for Aviation Equipment)? If yes, Will you provide capability to undertake calibration, as part of Engineering Support Package?	Yes / No
	(q) <u>Built in Test Equipment (BITE).</u>	
	(i) Will your product or any of its sub system have counter to display cumulative usage to facilitate usage based preventive/ periodic maintenance?	Yes / No
	(ii) Which systems & sub-systems can have built in diagnostic facility	
	(iii) Can diagnostic data & warnings be displayed on VDUs of crew	Yes / No
	(iv) Will you provide any Automatic Diagnostic Tools (ADT) with the equipment	Yes / No
	(r) <u>Quality Assurance (QA).</u>	
	(i) Can you provide FICV(Tr) as per QA standards mentioned in RFI	Yes / No
	(ii) Mention systems & sub-systems which cannot be compliant to Military Standard 464C & 461E	
	(iii) Mention details of systems which cannot be compliant to JSS-55555	

<u>Question</u>	<u>Questionnaire based on RFI for FICV(Tr)</u>	<u>Response</u>
	<p>(s) <u>Training Aids.</u></p> <p>(i) Can simulators for technical & tactical training as asked in RFI be provided</p> <p>(ii) Can AR/ VR based training packages as asked in RFI be provided</p> <p>(iii) Can sectionised working models as asked in RFI be provided</p> <p>(iv) <u>Vehicle as Simulators.</u> Can your FICV(Tr) and all its main systems (Automotive, Armament, Communication & Navigation) be used as a simulator for training of crew as well as for mission rehearsal</p>	<p>Yes / No</p> <p>Yes / No</p> <p>Yes / No</p> <p>Yes / No</p>
13.	<p><u>Additional Questions</u></p> <p>(a) <u>Comprehensive AMC.</u> Are you willing to undertake Comprehensive Annual Maintenance Contract (CAMC) for the complete FICV(Tr)? If yes, what is the indicative cost in terms of percentage of cost of per unit FICV(Tr)</p> <p>(b) <u>Product Support.</u> What is the period for which you will commit product support for sustenance of FICV(Tr) in terms of supply of spares/ calibration etc</p> <p>(c) <u>Upgrades.</u> Will it be possible to provide upgrades for life extension beyond stated service life of FICV(Tr)? If yes then, upgrades can be offered for which technologies (if available)</p> <p>(d) <u>Fuel, Oils & Lubricants.</u> Following details to be provided:-</p> <p>(i) Details of oils, lubricants and greases required along with their scales & periodicity of change</p> <p>(ii) IS specification of oils, lubricants and greases that will be utilised in your FICV(Tr)</p> <p>(iii) In case IS specification of any product is not available, then can you manufacture it in India</p> <p>(iv) Which systems & sub-systems cannot use existing grades of oils, lubricants and greases that are being utilised / procured by Indian Army</p> <p>(v) In case Propriety / Brand Specific Products are recommended, then please provide:-</p> <p>(aa) Details of original manufacturer along with full address and rates of items.</p> <p>(ab) All data to identifying equivalent products available in India.</p> <p>(ac) Will you provide all required Oils / Lubricant / Greases for maintenance for at least 02 years after induction of FICV(Tr)</p>	<p>Yes / No _ %</p> <p>__ yrs</p> <p>Yes / No</p> <p>if available</p> <p>if available</p> <p>Yes / No</p> <p></p> <p></p> <p></p> <p></p> <p>Yes / No</p>

<u>Question</u>	<u>Questionnaire based on RFI for FICV(Tr)</u>				<u>Response</u>
	(e) <u>Software.</u>				
	(i) List of systems & sub-systems that will use software				
	(ii) Which software will not be indigenous				
	(iii) Which software cannot be restored / reinstalled in field in case of any fault				
	(iv) Will all software be up-gradable				Yes / No
	(v) Will license for all software be available with you				Yes / No
	(f) <u>Battlefield Management System (BMS).</u>				
	(i) Can BMS as described in RFI be provided				Yes / No
	(ii) If no then what type of BMS can be provided in your FICV(Tr)				
	(iii) Can IFF as described in RFI be provided				Yes / No
	(iv) If no then what type of IFF can be provided in your FICV(Tr)				
	(v) Will FICV(Tr) vehicle be able to communicate with all other FICV(Tr) vehicles to provide situational awareness to each other to provide a BMS				Yes / No
	(g) <u>Evaluation by Simulations & Certifications.</u> List out various parameters of FICV(Tr) that can be evaluated through simulation/certification so as to enable incorporation of this aspect in the SQRs.				
	<u>SNo</u>	<u>RFI Parameters</u>	<u>Evaluation by Simulation</u>	<u>Evaluation by Certification</u>	

Appendix 'C'

(Refers to Paragraph 13(b) of FICV(Tr) RFI A/36830/FICV(Tr)/GS/MECH-8 dt 23 June 2021)

VENDOR INFORMATION PROFORMA: FICV(TRACKED)1. **Name of the Vendor/Company/Firm**

 (Company profile including Share Holding pattern, in brief, to be attached)

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

- (a) Original Equipment Manufacturer (OEM) Yes/No
 (b) Authorised Vendor of foreign Firm Yes/No (Attach details, if yes)
 (c) Other (give specific details).
- _____

3. **Contact Details.**

Postal Address: _____

City : _____ State : _____

Pin Code : _____ Tele : _____

Fax : _____ URL/Website : _____

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

Name & Address : _____

Pin Code _____ Tele : _____

Fax _____

5. **Financial Details.** Category of Industry (Large/Medium/Small Scale):6. **Certification by Quality Assurance Organization.**

Name of Agency	Certificate	Applicable from (Date & Year)	Valid till (date & Year)

7. **Details of Registration.**

Agency	Registration No	Validity (Date)	Equipment
GeM			
DGQA/DGAQA/DGNAI			
OFB			
DRDO			
Any other Government Agency			

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

Name of Organisation	Membership Number

9. **Equipment / Product Profile**

- (a) Name of Product : _____(IDDM Capability be indicated against the Product)
(Should be given category wise for e.g. all products under night vision devices to be mentioned together)
- (b) Description (attach technical literature): _____
- (c) Whether OEM or Integrator :
- (d) Name and address of Foreign collaborator(if any) :
- (e) Industrial Licence Number :
- (f) Indigenous component of the product (in percentage):
- (g) Status (in Service/Design & Development Stage) :
- (h) Production capacity per annum:
- (j) Countries / agencies where equipment supplied earlier (give details of quantity supplied):
- (k) Estimated price of the equipment: _____
-

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

11. Any other relevant information: _____

12. **Declaration.** It is certified that the above information is true and any changes will be intimated at the earliest.

(Note: Paragraph 44 and Appendix F to Chapter II DAP-2020 may be referred.)

(Authorised Signatory)

Appendix 'D'

(Refer to Para 16 of FICV(Tr) RFI
A/36830/FICV(Tr)/GS/MECH-8 dated
23 June 2021)

**GUIDELINES FOR FRAMING CRITERIA FOR VENDOR SELECTION/PRE-
QUALIFICATION**

To be read in accordance with the Vendor Qualification Criteria promulgated by Acquisition Wing vide MoD ID No 4(3)/D(Acq)/16-Pt.IV dated 18/09/2019 or as updated on <http://mod.gov.in>.

1. The success of a procurement scheme largely depends on the capability of the vendor. A judicious process is required to identify potential vendors who have the requisite capability, infrastructure, technical know-how and capacity to supply the required defence equipment. DAP-2020 lays down vendor selection criteria for 'Make' procedure and 'Strategic Partnerships'. However, no explicit criteria have been laid down for other procurement categories. Hence, a need is felt to frame guidelines to enable finalisation of pre-qualification criteria for vendors participating in procurement schemes under Buy (Indian-IDDM), Buy (Indian) & Buy & Make (Indian) categories.

2. Accordingly, the guidelines prescribed for short-listing/ pre-qualification of Indian vendors in Buy (Indian-IDDM), Buy (Indian) & Buy & Make (Indian) cases are enumerated in the succeeding paragraphs. **Para 3** deals with the parameters that may be considered for short-listing of vendors, whereas **Para 4** amplifies the process for applying selected parameters to the process of Vendor Short listing. These guidelines may be read in conjunction with Appendix A to Chapter III of DAP 2020 where relevant.

3. PARAMETERS

(a) **General Parameters**

(i) Applicant Entity should be an Indian Company (as defined under the Companies Act, 2013 as amended from time to time), owned and controlled by resident Indian citizens. The management of the Applicant Entity should be in Indian hands with majority representation on the board of directors. The chief executive(s) of the applicant Entity shall be resident Indian citizen(s) who are part of the Indian group owning and controlling the Applicant Entity. 'Control' shall include the right to appoint a majority of the directors or to control the management or policy decisions, including by virtue of their shareholding or management rights or shareholders agreements or voting agreements. Further, a company shall be considered as 'Owned' by resident Indian citizens if more than fifty percent (50%) of the capital in it is directly or beneficially owned by resident Indian citizens and/or Indian companies, which are ultimately owned and controlled by resident Indian citizens. This implies that the maximum permitted FDI shall be forty nine percent (49%). No pyramiding of FDI in Indian holding companies or in Indian entities subscribing to shares or securities of the Applicant Entity shall be permitted. Indirect foreign investment shall be accounted for in counting the forty-nine percent (49%) FDI.

(Note: FDI limit shall be in accordance with Consolidated FDI Policy Circular 2016 issued vide Ministry of Commerce & Industry, Department of Industrial Policy & Promotion D/o IPP F. No. 5(1)/ 2016-FC-1 dated 07 Jun 2016 and any amendments thereof.)

(ii) Business dealing with applicant Entity or any of its allied entities should not have been suspended or banned, by MoD/ SHQ or any Government Department or organization (as defined in Guidelines for Penalties in Business Dealings with

Entities issued vide Ministry of Defence, D(Vigilance) MoD ID No 31013/I/2006-D(Vig) Vol II dated 21 Nov 2016). None of the Promoters and Directors of applicant entity should be a wilful defaulter.

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

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

(b) **Technical Parameters**

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

(ii) Minimum **02 years** experience in **broad areas like manufacturing/ electronics/ explosives etc. as applicable in the instant procurement case**. If not, then cumulative experience of at **least 03 years in above areas**, resulting in gaining of competence for manufacturing the proposed product. (In case the SHQ feels that for a particular equipment a lesser experience could be accepted, then the same should be got approved by the competent authority before including the same in the RFP).

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

(c) **Financial Parameters**

(i) **Turnover**. Minimum average annual turnover for last three financial years, ending 31st March of the previous financial year, should not be less than 10% of estimated cost of the Buy (Indian-IDD) and Buy (Indian) project and for Buy & Make (Indian) should not be less than 10% of estimated cost of the Make portion.

(ii) **Net Worth**. Net worth of entities, ending 31st March of the previous financial year, should not be less than 5% of the estimated cost of the Buy (Indian-IDD) and Buy (Indian) project and for Buy & Make (Indian) should not be less than 5% of estimated cost of the Make portion.

(iii) **Insolvency**. The entity should not be under insolvency resolution as per Indian Bankruptcy Code at any stage of procurement process from the issuing of RFP to the signing of contract.

(iv) **Credit Rating (Desirable Financial Parameter)**. It would be desirable for the entity to have a minimum long term credit rating equivalent to CRISIL rating on Corporate Credit Scale as **CCR-BBB**, and **SME-04 for SMEs** issued by credit rating agencies recognized by SEBI. Credit rating should be as on 31st March of the previous financial year.

Note1: All the above Financial Parameters, except Para 3(c)(iii) above (Insolvency) will not be applicable for Capital Acquisition cases where estimated cost is Rs 150 Crore and below. However, Net worth of entities should not be **negative**.

Note 2: The turnover and net worth of the vendor shall be rounded off to the nearest lower ten/ hundred crore so as to keep the estimated cost of procurement confidential).

(d) **Other Parameters**

(i) **Industrial License (IL)**. Vendors should be either holding a valid defence industrial license or should have applied for the same before responding to RFP. In any case the vendor must confirm holding of IL before commencement of FET.

(Items requiring IL will be as per DIPP Press Note 3 of 2014 as amended from time to time).

4. **STIPULATIONS FOR APPLYING PARAMETERS**

(a) **Areas like manufacturing/ electronics/ explosives etc.** referred to at Para 3(b)(ii) should be defined in each case of procurement.

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

(v) A certificate from CA/CS indicating the financial parameters for the last three years as per Para 3(c).

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

(f) Any vendor furnishing false information will be liable for action under Para 93 of Chapter II of DAP 2020.

(g) Based on these generic parameters, more specific criteria should be evolved by the SHQs with regard to Technical and Financial parameters {Paras 3(b) and 3(c) above} in each procurement case depending upon requirements peculiar to each case keeping in view the overall need to ensure wider vendor participation. The specific criteria evolved by the SHQ for each case, as per these guidelines, may be got approved by the competent authority before including the same in the RFPs.

5. **Start Ups/ MSMEs.** Start ups would be defined as per G.S.R. 127 (E) dated 19 Feb 2019 (as amended from time to time). For procurement cases where the estimated cost is not exceeding Rs 50 Crore/ year based on delivery schedule at the time of seeking AoN or Rs 150 Crore, whichever is higher, to encourage the Start Ups/ MSMEs and build Industrial ecosystem, the recognized Start Ups/ MSMEs in the relevant fields may be considered for issue of RFP without any stipulation of Financial parameters, except Para 3(c)(iii) above (Insolvency) and with General and Technical parameters to be decided on case to case basis.

(Note: Start Ups should not be confused with New Entrants who may be high/ mid-sized groups having financial support and manufacturing experiences and now venturing into Defence Production).

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