BEML LIMITED,

BEML SOUDHA,

23/1, 4th Main

SAMPANGIRAMA NAGAR,

BENGALURU - 560027

Notice Inviting

Expression of Interest (EoI)

for Technology tie-up

For

Armoured Fighting Vehicle – Future Ready Combat Vehicle (AFV - FRCV) for Indian Army

Reference No:	**CTPAM/EoI/FPIIC/AFV-FRCV/2025/304**
Due closing date:	**21.04.2025**
EoI response mail ID:	**bemleoi@bemlltd.in**
Contact for Clarifications:	**Mr. Madhusudhan BH,** **General Manager(O)-R&D** **FPIIC, Bangalore Complex, BEML Ltd.,** **Bengaluru, Karnataka, INDIA** **Email: madhusudhan.bh@bemlltd.in** **Mobile: +91-7406897591**

Issued by

BEML LIMITED

(Schedule 'A' Company under Ministry of Defence, Govt. of India)

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SECTION-1

Disclaimer

The information contained in this Expression of Interest (EoI) document provided to the Prospective Collaborator(s), by or on behalf of M/s BEML Ltd., or any of its executives or advisors, is provided to the Prospective Collaborator(s) on the terms and conditions set out in this EoI document and all other terms and conditions subject to which such information is provided.

1. The purpose of this EoI document is to provide the Prospective Collaborator(s) with information to assist the formulation of their proposal. This EoI document does not purport to contain all the information each Prospective Collaborator may require. This EoI document may not be appropriate for all persons, and it is not possible for BEML Ltd., its executives or advisors to consider the business/investment objectives, financial situation and particular needs of each Prospective Collaborator who reads or uses this EoI document. Each Prospective Collaborator should conduct his own investigations and analysis and should check the accuracy, reliability and completeness of the information in this EoI document and where necessary obtain independent advice from appropriate sources.
2. BEML Ltd., its executives and advisors make no representation or warranty and shall incur no liability under any law, statute, rules or regulations as to the accuracy, reliability or completeness of the EoI document.
3. BEML Ltd., may, in its absolute discretion, but without being under any obligation to do so, modify, amend or supplement the information in this EoI document.
4. The issue of this EoI does not imply that BEML Ltd., is bound to select and shortlist any or all the Prospective Collaborator(s). Even after selection of suitable Prospective Collaborator, BEML Ltd., is not bound to proceed ahead with the Prospective Collaborator and in no case be responsible or liable for any commercial and consequential liabilities in any manner whatsoever.
5. The Prospective Collaborator(s) shall bear all costs associated with the preparation, technical discussion/presentation and submission of response against this EoI. BEML Ltd., shall in no case be responsible or liable for these costs regardless of the conduct or outcome of the EoI process.
6. Canvassing in any form by the Prospective Collaborator(s) or by any other agency on their behalf shall lead to disqualification of their EoI.

7. Notwithstanding anything contained in this EoI, BEML Ltd., reserves the right to accept or reject any application and to annul the EoI process and reject all applications, at any time without any liability or any obligation for such acceptance, rejection or annulment and without assigning any reasons, thereof. In the event that BEML Ltd., rejects or annuls all the applications, it may at its discretion, invite all eligible Prospective Collaborators to submit fresh applications.
8. BEML Ltd., reserves the right to disqualify any applicant during or after completion of EoI process, if it is found there was a material misrepresentation by any such applicant or the applicant fails to provide within the specified time, supplemental information sought by BEML Ltd.,
9. BEML Ltd., reserves the right to verify all statements, information and documents submitted by the applicant in response to the EoI. Any such verification or lack of such verification by BEML Ltd., shall not relieve the applicant of his obligations or liabilities hereunder nor will it affect any rights of BEML Ltd.,

SECTION-2

Schedule of EoI process & Contact details

A. Schedule of EoI process

The schedule of activities during the EoI Process shall be as follows -

Sl. No.	Description	Date
01	Issue of EoI Document	20.03.2025
02	Last date of Submission of EoI response	21.04.2025

B. Contact Details related to EoI

Mr. Madhusudhan BH,
General Manager(O)-R&D
FPIIC, Bangalore Complex, BEML Ltd.,
Bengaluru, Karnataka, INDIA
Email: madhusudhan.bh@bemlltd.in
Mobile: +91-7406897591

Note:

Submission of the EoI

The EoI shall be submitted **before 21.04.2025 through email only** mentioning EoI reference: CTPAM/EoI/FPIIC/AFV-FRCV/2025/304 dtd 20.03.2025 in Subject to bemleoi@bemlltd.in

Queries if any, may be forwarded to madhusudhan.bh@bemlltd.in and bemleoi@bemlltd.in

SECTION-3

ABOUT BEML LIMITED

a. BEML Limited is a leading multi-technology and multi-location company under the Ministry of Defence operating under three major Business verticals viz., Mining & Construction, Defence & Aerospace and Rail & Metro which are classified into 12 SBU's & 2 Micro SBU's. The three verticals are serviced by manufacturing units at four locations viz Bengaluru, Kolar Gold Fields (KGF), Mysuru and Palakkad.

b. BEML offers high-quality products for diverse sectors of economy such as Defence, aviation, coal, mining, steel, limestone, power, irrigation, construction, road building, metro & railways.

c. BEML has emerged as the forerunner of heavy engineering industry with a track record of growth and revenues for over Six decades. For further details please visit our website www.bemlindia.in

More details about the entire range of BEML's products and operations can be viewed by visiting our web site www.bemlindia.in

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SECTION-4

Details of Expression of Interest (EoI)

4.1 Introduction:

BEML invites Expression of Interest (EoI) from the Prospective Collaborator(s), who are willing to associate with BEML Ltd., through a License & Technology Collaboration Agreement (**TCA**) for joint development of Armoured Fighting Vehicle – Future Ready Combat Vehicle (AFV-FRCV) for Indian Army to enable BEML Ltd., to Design, Engineer, Manufacture, Assemble, Test, Supply, Field Install, Commission, Repair, Service and Retrofit. Ministry of Defence, Govt of India intends to procure Armoured Fighting Vehicle – Future Ready Combat Vehicle (AFV-FRCV) under Buy (Indian-IDDM) Category of Chapter II of Defence Acquisition Procedure (DAP) 2020. Buy (Indian)-IDDM Category refers to the acquisition of from an Indian vendor for the products that have been indigenously designed, developed and manufactured with a minimum of 50% Indigenous Content (IC) on cost basis of the base contract price i.e., total contract price less taxes and duties.

The latest version of DAP 2020 can be accessed on GOI, MoD website: https://mod.gov.in/dod/defence-procurement-proc--dap.

4.2 Scope of Cooperation:

BEML Ltd., is seeking Expression of Interest(s) from Prospective Collaborator(s) through TCA for joint development of Armoured Fighting Vehicle – Future Ready Combat Vehicle (AFV-FRCV) for Indian Army. The TCA shall enable BEML Ltd., to Design, Engineer, Manufacture, Assemble, Test, Supply, Field Install, Commission, Repair, Service and Retrofit Armoured Fighting Vehicle – Future Ready Combat Vehicle (AFV-FRCV) for Indian Army. The Prospective Collaborator(s) meeting the Pre-qualification requirements (PQR) as specified in clause 4.3 below are invited to submit their response to this EoI, as per indicative scope of technology transfer given in **Annexure-1**. Upon receipt of response(s) against this EoI, BEML Ltd., will review the response(s) to ascertain suitability of the offer and shortlist Prospective Collaborator(s) for further discussions. Detailed discussions on commercial and other terms and conditions to finalize the TCA

shall be held with shortlisted Prospective Collaborator(s). The detailed terms and conditions for said TCA shall be mutually agreed upon.

4.3 Pre-qualification requirements (PQR)

The Prospective Collaborator(s) shall meet following qualification requirements as on the date of submission of EoI (to be substantiated by a documentary evidence):

1. The Prospective Collaborator should have designed, engineered, manufactured, tested, supplied and commissioned similar Mobility vehicle (broad technical specifications at Annexure-3) and such equipment should have completed at least three (03) years of service as on date of closing of this EoI.

OR

2. The Prospective Collaborator should have designed similar Mobility vehicles (broad technical specifications at Anenxure-3) and their designed equipment should have completed at least three (03) years of service as on date of closing of this EoI.

Note:

Prospective Collaborator (s) shall take the responsibility for transfer of know how in the area of Design, Engineer, Manufacture and testing of Armoured Fighting Vehicle – Future Ready Combat Vehicle (AFV-FRCV) for Indian Army to BEML Ltd., within the specified timeframe.

4.4 Instructions:

4.4.1 The interested Prospective Collaborator(s) should submit their response(s) along with enclosed annexures on or before **21.04.2025**.

Annexure-1: Indicative Scope of Technology Transfer.

Annexure-2: Prospective Collaborator's Experience in the field of Armoured Fighting Vehicle – Future Ready Combat Vehicle (AFV-FRCV) for Indian Army.

Annexure-3: General technical specifications of Armoured Fighting Vehicle – Future Ready Combat Vehicle (AFV-FRCV) for Indian Army proposed for TCA.

Annexure-4: Reference List: The Prospective Collaborator’s major supplies in last 15 years.

Annexure-5: EoI response format.

Annexure-6: Certificate as to Authorized Signatories.

Annexure-7: Declaration by the Prospective Collaborator regarding litigation.

Annexure-8: Declaration by the Prospective Collaborator regarding blacklisting.

4.4.2 The response shall necessarily be accompanied with following details:

1. Company background
2. Product Profile
3. Technical details
4. Reference list of customers
5. Annual Audited financial reports for last 3 (three) years.

4.4.3 Language: All correspondences and documents related to the EoI response shall be in English language, provided that any printed literature furnished by the Prospective Collaborator(s) may be written in another language, as long as such literature is accompanied by a translation of its pertinent passages in English language in which case, for purposes of interpretation of the bid, the English translation shall govern, provided that in case the English translation is found to be incorrect at a later stage, BEML Limited will have right to take appropriate action against the Prospective Collaborator as may be deemed fit.

4.4.4 The Prospective Collaborator(s) shall abide by the terms & conditions, as applicable, of the EoI.

4.4.5 All pages of the response against this EoI shall be duly signed by the authorised signatory. Over writing should be avoided. Copies of the credentials/ documents which are to be annexed must be self-attested and bear the signature and seal of the authorized signatory / authorised representative of the interested Entity/Firm/Company. The interested Entity/Firm/Company will be requested to produce the originals of all information / documents as and when so required by BEML.

4.4.6 Multiple proposals from the same Perspective Collaborator should not be submitted.

4.4.7 BEML Ltd., at its discretion shall inspect the Prospective Collaborator's

works/office/reference site premises for the purpose of evaluation, as deemed necessary before selection of Collaborator. BEML Ltd., decision in this regard shall be final.

4.4.8 Any Prospective Collaborator which has been declared insolvent, bankrupted, debarred/blacklisted by Central/State Governments of India or by any entity controlled by Central/State Governments of India from participating in any of their project, as on date of submission of EoI, shall not be eligible to submit the EoI.

4.4.9 BEML Ltd., shall receive applications pursuant to this EoI in accordance with the terms set forth herein, as may be modified, altered, amended and clarified from time to time by BEML Ltd., and all applications shall be submitted in accordance with such terms on or before the date specified in this EoI for submission of applications.

In case any amendment/corrigendum to this EoI is issued, it shall be notified only at www.bemlindia.in. which shall form part of this EoI

4.4.10 Restrictions on Prospective Collaborator from a Country which shares a Land Border with India:

a) Interested Prospective Collaborator from a country which shares a land border with India will be eligible to respond to this EoI only if interested Prospective Collaborator is registered with Competent Authority (Registration Committee constituted by the Department of Promotion of Internal Trade (DPIIT) of Govt. of India). Such registration should be at least valid for the entire period of EoI due date or any extension thereof.

b) Interested Prospective Collaborator from a country which shares a land border with India means: a) An entity incorporated, established or registered in such country; or b) A subsidiary of an entity incorporated, established or registered in such country; or c) An entity substantially controlled through entities incorporated, established or registered in such country; or d) An entity whose beneficial owner is situated in such a country; or e) An Indian (or other) agent of such an entity; or f) A natural person who is a citizen of such a country; or g) A consortium

or joint venture where any member of the consortium or joint venture falls under any of the above.

4.5 REJECTION: An Expression of Interest is liable to be rejected for any of the following conditions:

4.5.1 The Expression of Interest is not accompanied by required documentation and has failed to provide clarifications related thereto, when sought by BEML.

4.5.2 Misrepresentation, lack of proper documentation, fraud, coercion, undue influence, canvassing etc.

4.5.3 The Expression of Interest is received after the closing time and date. If any information which would have entitled BEML to reject or disqualify the applicant becomes known after the applicant has been qualified, it reserves the right to reject the applicant at that time or at any time after such information becomes known to BEML.

4.6. PROCESS TO BE CONFIDENTIAL:

Information relating to the examination, clarification, evaluation and comparison of EoI and recommendations shall not be disclosed to Prospective Collaborator(s). Any effort by Prospective Collaborator(s) to influence BEML Ltd., in processing of EoI or selection decisions may result in the rejection of the response against EoI.

4.7 GOVERNING LAWS & JURISDICTION:

The EoI process shall be governed by, and construed in accordance with the laws of India and the Courts at Bangalore (India) shall have exclusive jurisdiction over all disputes arising under, pursuant to and / or in connection with the EoI process.

Foreign entity interested for collaboration with BEML for Vehicle Based Mine Scattering System must have necessary clearance from their Govt. for Technology Sharing/ Transfer & Collaboration.

Annexure-1

Indicative Scope of Technology Transfer

Sl. No.	Description
(a)	Licensing and transfer of state-of-the-art technology relating to Design, Engineer, Manufacture, Assemble, Test, Supply, Field Install, Commission, Repair, Service and Retrofit Armoured Fighting Vehicle – Future Ready Combat Vehicle (AFV-FRCV) for Indian Army.
(b)	Transfer of improvements / modifications / developments / upgradations to be carried out by the Prospective Collaborator(s) during the period of TCA for taking care of new market requirements and obsolescence. Subsequent updates required due to component obsolescence or updates implemented by Prospective Collaborator(s) due to safety consideration would also be provided.
(c)	Assistance in planning & establishing the new manufacturing, assembly and testing facilities & processes / suitable augmentation at BEML Ltd.'s existing facilities / processes by way of expert advice in terms of identifying, sizing & selection and preparation of specification of equipment / machinery required for manufacturing, their layout and foundation etc. Deputation of Collaborator's expert for commissioning of the manufacturing facilities, design of special tools and dies, jigs & fixtures etc.
(d)	Support through engineering services from Collaborator's design office / manufacturing facilities for licensed products.
(e)	Training of BEML Ltd., engineers to Design- know-how knowledge transfer, Engineer, Manufacture, Assemble, Test, Supply, Field Install, Commission, Repair, Service and Retrofit the Armoured Fighting Vehicle – Future Ready Combat Vehicle (AFV-FRCV) for Indian Army.
(f)	Deputation of Collaborator's experts to assist BEML Ltd., in absorbing the technology for licensed products.
(g)	Transfer of applicable Proprietary software / computer programs including logics and source code, if any.
(h)	During the field trials and regular operation, if any modifications / updates are carried out to improve the performance / reliability of the system the same shall also be transferred to BEML Ltd., with complete know-how.
(i)	Technology being proposed should be the latest / state-of-the-art being marketed by the Prospective Collaborator.
(j)	Transfer of information to enable BEML Ltd., to source/procure those items, which Prospective Collaborator sources from other vendors (as these are not manufactured by the Prospective Collaborator) for use in Armoured Fighting Vehicle – Future Ready Combat Vehicle (AFV-FRCV) for Indian Army.
(k)	Manufacturing 2D drawings of all the developed components are to be prepared. Installation or Mounting drawings of off-the-shelf or proprietary components drawing may be received from the respective suppliers. 2D layout drawings are to be prepared for all sub assembly of components including system wise. Casting and forging drawings are to be prepared only for critical components.

(l)	Deputation of BEML engineers to work with collaborator design team in order to absorb the technology/process being followed for licensed products.
(m)	Collaborator should enter in to a joint agreement on Intellectual Property Rights (IPR) with BEML Ltd.

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Annexure-2

Prospective Collaborator's Experience in the field of Armoured Fighting Vehicle – Future Ready Combat Vehicle (AFV-FRCV) for Indian Army

Sl. No	Requirement	Prospective Collaborator's response YES/NO and remarks, if any
(a)	Whether the Prospective Collaborator is an Original Equipment Manufacturer (OEM) of proposed Armoured Fighting Vehicle – Future Ready Combat Vehicle (AFV-FRCV) for Indian Army or similar Vehicle.	
(b)	Whether documentary evidence to substantiate the below PQRs has been submitted by Prospective Collaborator.	
(c)	The Prospective Collaborator should have designed, engineered, manufactured, tested, supplied and commissioned similar Mobility vehicle (broad technical specifications at Annexure-3) and such equipment should have completed at least three (03) years of service as on date of closing of this EoI. OR The Prospective Collaborator should have designed similar Mobility vehicles (broad technical specifications at Anenxure-3) and their designed equipment should have completed at least three (03) years of service as on date of closing of this EoI.	
(d)	Whether information on market share has been enclosed.	
(e)	Whether Prospective Collaborator's detailed reference list have been enclosed.	
(f)	Whether Prospective Collaborator's annual audited financial reports for last 3 years have been enclosed.	
(g)	Whether the Armoured Fighting Vehicle – Future Ready Combat Vehicle (AFV-FRCV) for Indian Army or similar Mobility Vehicle offered for technology collaboration is the latest being marketed by the Prospective Collaborator.	
(h)	Whether customers (end users) letters / documentary evidence for satisfactory operation of model for Armoured Fighting Vehicle – Future Ready Combat Vehicle (AFV-FRCV) for Indian Army which is being offered to BEML Ltd.,	

	under this EoI have been enclosed.	
(i)	Whether the Prospective Collaborator owns the IPRs for the technology being proposed for transfer under the Technology Collaboration Agreement (TCA) or have an unencumbered right from the owner of the IPRs to sub-license the technology, if applicable. If yes, whether list of such IPRs is enclosed.	

Signature & Seal:

Authorised Signatory of the Prospective Collaborator

Annexure-3

General technical specifications of Armoured Fighting Vehicle – Future Ready Combat Vehicle (AFV-FRCV) for Indian Army proposed for TCA

S.No.	Major Systems	Requirement	Notes (if any)
1	Crew	04 personnel including driver	The crew should be accommodated within the platform and maximum protection should be made available to the crew compartment.
			The crew will be required to be enabled for controlling all the New Generation Equipment (NGE) to include drones, Loiter Munitions (LM) and Active Protection Systems
2	Operating Temperature Range	All systems and assemblies including ammunition should be able to operate in a range of (-)20°C to (+)45°C.	
3	Fire Power	Should be able to destroy enemy ICV, soft skinned vehicles and enemy soldiers with accurate and effective machine gun fire.	
3(a)	Main Armament	The calibre should be minimum 120 mm. Should be capable of engaging targets up to 2500m with APFSDS ammunition and up to 5000 m with ATGM.	Should be capable of firing APFSDS, HE, HEAT, ATGM & LMs.
3(b)	Missile Firing Capability	(i) Should incorporate day and night missile firing capability. Should be able to engage targets moving both broad side and oblique. (ii) Anti-tank and Anti-helicopter capability.	The missile firing capability should be through the barrel. Effective for a minimum range of 500 m and up to a range of 5000 m.

3(c)	Fire Control System	All weapons should be connected with targeting sights and the fire control computer through the fully digitised architecture, allowing for hunter-killer and killer-killer operation, seamless target engagements and capability to incorporate AI decision support.	FCS should incorporate automatic target tracker / Lock on Launch system to maintain the gun on a moving target while own tank is also moving. Provision must also exist to track, lay the gun and engage targets independent of the gunner.
			FCS should be unified and integrated with duality of controls to cater for effectively firing different types of ammunition according to individual characteristics of ammunition and to integrate with BMS, IFF to generate common Fire Control Picture (FCP)
3(d)	Loiter Munitions	LM tubes and ammunition incorporated within the platform to be launched to engage targets up to a minimum range 15 km on signal from an Integrated Surveillance Drone (with a minimum operating range of 20 km) with suitable human interface.	
3(e)	Secondary Armament	Should have a Coaxial Machine Gun of calibre 7.62mm for ground targets and an Anti-Aircraft machine gun of calibre 12.7mm.	The coaxial machine gun should be able to engage targets effectively up to 1500m and the anti-aircraft machine gun should be capable of engaging aerial targets up to an effective range of 1500m and ground targets up to an effective range of 2000m.

3(f)	Ammunition	Should have the capability to fire the ammunitions to include: (i) Kinetic Energy (KE) Projectiles (APFSDS). (ii) Chemical Energy (CE) (HE, HEAT). (iii) ATGM with tandem warhead. (iv) Loiter Munitions (LM). (v) Secondary armament ammunitions.	
4	Protection	Should be to operate in a dense anti-tank environment. Protection and the ability to absorb hits would thus be essential.	Should provide all round protection from small arms fire and medium artillery splinters and direct anti-tank fire.
			It should provide protection from under belly mines and IEDs. It should also cater for protection from drones, LMs, and other forms of top attack munitions.
			It should have active and passive protection systems to include stealth and signature management technologies.
			It should be able to operate in CBRN environment and protect the crew for at least six hours. It should also cater for adequate protection from fire in terms of quick detection and fast fire suppression.
			It should be able to generate smoke on its own to hide its own movement.
5	Mobility	All weather operations in plains, deserts, semi-deserts, marginal terrain, high altitude area, mountainous terrain and island territories.	
5(a)	Operating Range	Not less than 400km in Cross-Country / Desert Terrain and 500km on Road (without need for re-fuelling)	

5(b)	Fording Capability	Minimum Fording Capability of 05m depth.	
5(c)	Transmission	Automatic Transmission System or Continuous Variable Transmission with Mechanical Redundancy.	
5(d)	Suspension	Rugged suspension to provide a stable firing platform and smooth drive for cross country speeds up to 50 kmph.	
5(e)	Self-Recovery	Suitable arrangements for self-recovery	
5(f)	Speed	(i) **Forward:** With ECU 'ON', minimum 50kmph cross country and minimum 70kmph on road. (ii) **Reverse:** With ECU 'ON', minimum 20kmph with multiple reverse gear ratios.	
6	**Communication**	**Radio Communication:** Should have arrangements to incorporate Buyer Nominated Equipment compatible with in-service radio sets and secrecy devices.	It should be Network Enables for supporting additional feeds from UAV, Drones and other elements of Combat Group including Attack Helicopters and Aircrafts.
		External and Internal Communication: All crew members of the AFV - FRCV should be able to communicate with other outstations on the external radio network based on the Software Defined Radio (SDR)/	It should have a digital Inter-Crew Communication System for all the crew members, independent of the radio sets utilizing common hands-free gear assemblies.
		Tactical Wifi Network System: Within an area of 10 sq. km capable of transmitting high speed data and situational awareness picture. Transmitting of high speed data should have a 256 bit Advanced	

		Encryption Standard.	
7	**Niche Capabilities**	7 (a) Human Machine Teaming & Integrated Intelligence Surveillance Reconnaissance (ISR) Capability	Capable of controlling assigned UAVs such as on-board or off-board drones & LMs & capability to operate Tethered drone.
		7 (b) Net Centric Warfare / Battlefield Management System	Identification of Friend or Foe giving common operational picture to support collaborative all weather operations, should be scalable and cater for shared situational awareness, with quick data exchange.
		7 (c) BLOS Strike Capability	Employ LMs in conjunction with surveillance drones as a system from the platform.
		7 (d) 360° Vision System	Day / Night sights mounted around the hull and turret, providing a 360° coverage as well as input, akin to concept of see-through armour to the C4I system.
		7 (e) Cyber Warfare & Electronic Warfare Capability	Should be fully cyber hardened, capable of operating in a contested EM spectrum and be able to operate in Intense EW Environment with Counter Jamming abilities for a secure voice and data communication as well as controlling Drones / Swarms.
7(f)	Navigation Systems	Hybrid Navigation System	IRNSS and Inertial Navigation integration
			Compatibility with Defence Series Maps (DSM)
			Indirect fire assistance module
		Navigation Data Sharing	Integration with communication systems for real-time data dissemination

Technical Parameters			
8	**Combat Weight**	Full Combat Weight 55 ± 5% tons. Enhanced weight should cater for enhanced protection aspect in FRCV.	
9	**Dimensions**	Minimum Ground Clearance of 450mm from the lowest part of the tank should be ensured.	Dimensions should not impede its transportability by in-service rail, road, air and sea equipment, should conform to existing Over Dimensioned Consignment (ODC) limit ODC Class - A of Indian Railways.
10	**Service Life**	Minimum service life of 35 years extendable to 45 years with upgrades.	
11	**Fire Power**		
11(a)	Main Armament	Minimum 06-08 rounds per minute	
11(b)	Angle of Firing (Main Armament)	(i) Depression: Minimum 08° (ii) Elevation: Minimum 20° with ability to fire ammunition in indirect mode. (iii) Traverse Angle: Main Gun should be 360° traversable.	

11(c)	Fire Control System	(i) **Automatic Target Detection & Tracking System (ATDTS):** Capable of a 'lock-on' mode, which can acquire and track specific targets up to a range of 10 kilometres. (ii) **Hunter Killer Mode:** Day & Night capability for commander to search and queue up to three targets to a range of 5000m, while the gunner is engaging the first Lock on launch & lining of up to three targets for auto designation to Gunner. Automatic laying of gunner's sight on next target, once first engagement is successfully concluded. A feature of inbuilt security should be incorporated to ensure safety of crew whenever the turret is being operated.	

		(iii) **Killer Mode:** The Tank Commander and Combat Operator should also have the capability to engage targets in addition to the Gunner with the main gun and also with the secondary weapons / LM in case the Gunner is engaged in operating the main gun. A feature of inbuilt security should be incorporated to ensure safety of crew whenever the turret is being operated. (iv) Able to engage stationary tank and broadside moving tank with speed of 25kmph at 2000m with primary ammunition. (v) Able to engage in both moving (platform & target) condition at 2000m with both tank and target speeds of 25kmph with primary ammunition. (vi) Minimum Identification Ranges (Standard Tank Target) 2000m both by day and night.	
		(vii) Capability to fix own position and carry out indirect fire. (viii) Auto Muzzle Reference System (MRS) for final correction by suitable sensor. (ix) Provision to allow the main armament and the Remote-Controlled Weapon System (RCWS) AAMG to be able to engage different targets simultaneously.	

11(d)	Lethality	(i) **KE (Kinetic Energy):** Depth of Penetration (DoP) greater than 650mm at 2000m at 60° Angle of Attack on a Rolled Homogeneous Armour (RHA) target.	
		(ii) **CE (Chemical Energy):** (aa) **HEAT:** DoP greater than 800mm at 2000m at 60° Angle of Attack on a RHA target. (ab) **HE:** Lethality - Minimum 50m diameter against Light Vehicles.	
		(iii) **ATGM:** Smart Top-Attack Munitions (STAM) Fire & Forget, top-attack anti-tank munitions fired from the main gun / externally mounted launcher. DoP should be minimum 800mm on RHA at 5000m and capable of engaging targets at progressive ranges from 500m up to 5000m.	
		(iv) **LM:** Capable of housing and launch of LM from tank with minimum DoP of 500mm on RHA in top attack mode to engage targets up to a minimum range of 15km. Modular construction for ease and accessibility for replenishment, repair and replacement.	
11(e)	Secondary Armament	(i) **Coaxial Machine Gun:** 7.62mm with minimum range ≥ 1800m.	

		(ii) **Anti-Aircraft Machine Gun:** 12.7mm in-service or improved with undermentioned capability: (aa) RCWS with radar / suitable sensors capable of automatically tracking and locking on aerial targets like drones and mini RPAs and have suitable ammunition (fragmentation, incendiary, proximity fuse etc) for destroying such targets. (ab) RCWS capable of (-)15° to (+)85° elevation for full hemispheric coverage. (ac) Stabilised in both planes (traverse and elevation). (ad) In-built safety feature be included for anti-aircraft machine gun to prevent damage to crew, main gun and body of the AFV due to accidental traverse of RCWS and firing of anti-aircraft gun.	
11(f)	Ammunition Storage Capacity	(i) **Main Gun:** Min 32 rounds (ii) **ATGM:** Min 08 missiles (iii) **12.7mm AAMG:** 1000 rounds (iv) **7.62mm MG:** 2000 rounds	
12	**Day and Night Vision Devices**		

12(a)	Commander and Gunner: Two axis independent stabilised, multichannel optical sight, with Laser Range Finder (LRF).	(i) **FOV for Day:** Minimum 22° (W) & 5° (N) (ii) **LRF:** Eye Safe with minimum 5km range. (iii) **Panoramic Sight:** For commander with 360° FOV. (iv) **DRI:** Not less than 5000/3000/2000m. (v) **Thermal Imager:** Incorporating a fusion of SWIR, MWIR & LWIR for enhanced resolution at diverse ranges with FOV in 9° x 7° (W) & 3° x 2.25° (N).	
12(b)	Driver	Day cum night fusion sight with viewing range at least 500m by day and 350m by night, with FOV 120° by Day and 45° by Night. FOV of driver may be increased by providing night vision periscopes on both sides.	
12(c)	Combat Operator	(i) Feed of Panoramic Sight for Commander with 360° FOV. (ii) DRI not less than 5000/3000/2000m respectively. (iii) Thermal Imager incorporating a fusion of SWIR, MWIR & LWIR for enhanced resolution at diverse ranges with FOV minimum 9° x 7° (W) and 3° x 2.25° (N).	
13	**Survivability**		

13(a)	Passive Protection	(i) Minimum 800mm RHA equivalent protection with suitable solution in the frontal 60° arc and minimum 600mm equivalent RHA protection with suitable light weight solutions for all round protection. (ii) Belly of tank must be able to survive Improvised Explosive Device (IED) & mine blasts of minimum 15 kgs of TNT. (iii) Protection against top attack munitions should be provided equivalent to protection with minimum 600mm RHA by a suitable light weight solution without compromising the silhouette. (iv) Crew compartments must be fitted with spall liners. (v) Armour Protection should be capable of incorporating modular armour including Explosive Reactive Armour (ERA) / Non Explosive Reactive Armour NERA which could be scalable. (vi) Provision to mount separate modular attachment for clearing path for moving across minefield.	
13(b)	Active Protection	Active Protection Suite (APS) to contribute to the 360° all-round protection with a dedicated Top Attack Protection System utilising soft kill (detection and disruption against hostile elements laser designation, ranging, missile launch, missile homing etc) & hard kill	

		systems (to destroy / deflect incoming projectiles).	
13(c)	Missile Warning System	Pre-Shot Detection Capability with LASER Warning System with Directional smoke dispenser or any other solution as counter measure.	
13(d)	CBRN Protection	The Crew and all Systems should be protected against the effects of Nuclear Explosions, EM Pulse Attacks, toxic Chemical Agents and Biological Warfare Agents and be able to operate effectively in a CBRN environment for minimum 06 hours. It should also incorporate an automated digital CBRN Warning system along with serviceability indication.	
13(e)	Instant Fire Detection and Suppression System	The FRCV must incorporate environment-friendly, non-ozone depleting suppressant materials, and having an automatic activation response and fire detection of not more than 20ms. The sire should be suppressed within 130ms in crew compartment and 10s for the engine compartment along with serviceability indications.	

13(f)	Stealth and Signature Management	Incorporate Signature Management Technology to suppress various signatures viz. Visual / Acoustic / InfraRed / Thermal by 50% suppression, in range of observation. Suitable Multi Spectral Camouflage (MSC) / Adaptive Stealth Solutions should be incorporated.	
13(g)	Smoke Grenade Dischargers	Create a smoke screen of 30m width and 10m height, minimum 75m range for a minimum of two minutes (or more) with anti-thermal and anti-laser protection up to 1500m by firing a salvo of adequate grenades within 20s (or less) of firing grenades.	
13(h)	BLOS Strike Capability	Able to employ LMs to engage targets up to a minimum distance of 15km in conjunction with surveillance drones with a flying range of up to a minimum 20km (compatible with in-service surveillance drones with suitable human interface) as a system from the platform.	
13(i)	Safety	Safety measures to include spall liner plates or alternate solutions around the armament to protect crew against accidents due to armament failure be incorporated. Armament system should be ruggedized for operational safeties (double ramming of rounds, accidental fire without completion of firing cycle, safety in auto loading etc.)	

14	**Mobility**		
14(a)	Power Pack	Minimum 1500 horse power (HP). The life of the Engine (without overhaul) should not be less than 750 engine hours. Engine to be provided with De-rating facility to cater for High Altitude Area (HAA) operations. It should have a provision for dual mode of starting of engine in addition to electric slave start from another vehicle.	
14(b)	Power to Weight Ratio	Not less than 27:1 (HP/Ton)	
14(c)	Nominal Ground Pressure (NGP)	Not more than 0.90 kg/cm2.	
14(d)	Obstacle Crossing	(i) **Ditch Crossing:** Not less than 2m. (ii) **Vertical Step:** Min 1m. (iii) **Gradient Negotiation:** ≥35° (iv) **Side Slope:** ≥25°	
14(e)	Towing Arrangements	Two hooks both in front and rear of hull.	
14(f)	Tracks	Quick-fit and Detachable Pads / Composite Tracks, incorporating a Dynamic and Automatic Track Tension Measurement and Adjustment System.	
14(g)	Suspension	Hydro Pneumatic / Hydro gas / Semi-active suspension capable of providing a stable weapon platform to achieve desired engagement in varying terrain at cross country speeds of minimum 50 kmph. Facilitate firing while deployed on slopes and with cant angle.	

14(h)	Batteries	Latest technology rechargeable batteries, preferably in-service, like Li-ion / LiFeO4 / Li-Polymer with BMS system / Lead Acid VRLA of adequate capacity, required for starting of Engine as well as powering of sub-systems may be used.	
15	**Quality Assurance Aspects**	Should conform to relevant MIL standard, suitable JSS standard / other internationally accepted standards.	
15(a)	Navigation Systems	Conform to L2J Table of JSS 55555 (latest version), Navigation System should be compatible with IRNSS & DSM.	
15(b)	Electrical and Electronic Systems	Conform to applicable defence standards and environment conditions as per L2J Table of JSS 55555 (latest version) / equivalent international standards. For Opto-Electronics System (Fire Control Instruments) JSS 5855-11, 2019 would be applied during Tech Evaluation.	
15(c)	EMI / EMC Compliance	(i) **System / Platform level (for Military Grade Equipment):** As per MIL - STD - 464C. (ii) **Sub System Level (for Military Grade Equipment):** As per MIL - STD - 464E or better. (iii) **COTS System / Sub System (for Commercial Equipment):** As per CISPR / IEC / FCC standards.	

15(d)	Technical Literature as specified in JSS 0251-01 (latest version) be made available by Development Agency prior to Maintainability Evaluation Trials (MET)	(i) **Documentation:** Documentation for all electronic and electrical equipment shall be provided as per JSS 0251 & DAP 2020. (ii) **Software:** Software coding standards and IV & V testing as per IEEE 12207 / JSG 0950 shall be followed. Non-malware certification and approval of software along with version of the software should be provided. Software guidelines as per IEEE 12207 / JSS 0950 shall be followed. (iii) **Drawings:** Drawings procedure for Electronics and Electrical Stores shall be as per JSS 5003.	
		(iv) **ESS Plan:** ESS plan for all electronics and electrical equipment shall be provided as per JSS 0613. (v) **Field Evaluation Trials:** All DA / Firm / Consortiums should submit the equipment for field evaluation along with pre-inspection reports and documents up to component level, as per JSS 0251. (vi) **For Physical Evaluation:** Certification can be obtained from DA / Firm / Consortium wrt evaluation of the equipment / system as per JSS 55555, with pre and post-performance checks as per mutually agreed ATP. Test reports along with certification from NABL / Govt / Internationally accredited lab would be acceptable.	

Maintainability and Ergonomic Parameters			
16	**Vectronics**	Condition Based Monitoring System to display health of the platform relating to Automotive Armament and Electronics aspects for timely predictive and preventive maintenance.	
17	**Modularity**	Basic Configuration preferred to be module and allow easy accessibility and reconfiguration of components for repair and maintenance in order to provide greater flexibility in operational role	
18	**Auxiliary Power Unit**	APU Power Output not less than 13KW at 27.5±1V DC. Capable of running all sub systems of tank for minimum six hours at a time. Based on common fuel as main engine / fuel cell technology.	
19	**Cold Start Capability**	Suitable Cold Start capability for the main engine and the APU engine at specified minimum temperature ranges / environment conditions as per Operating Temperature Range.	

20	**Ammunition Loading Provision**	Ammunition should be auto loaded with minimum 16 rounds ready for auto loading along with provision for Semi-automatic and Manual Loading. Common for all ammunition types including ATGM in case of Gun Tube Launched ATGM (GLATGM). In case of externally launched ATGM system, provision should be made for minimum 02 missiles in ready to fire mode and reloading of missiles to be executed without exposing the crew.	
21	**Gun Control System**	All Electric-Drive System in both horizontal and vertical planes with backup manual operation for both traversing and elevating mechanisms.	
22	**Ammunition Stowage**	(a) All ammunition should be stored in easily accessible containerised compartments (Bustle Loader), with suitable safety measures like Blow-Off Panels, to ensure Crew Protection from any accidental explosion involving blast, heat and fire. (b) Cater for Stowage of Missiles and LM.	
23	**Environment Control Unit**	(a) 25°±05° C (hatched closed) in an ambient temperature range from (-)5° to (+)45°C. (b) For temperatures above (+)45°C ambient, a minimum of 15°C drop in temperature within the tank must be effected. Similarly, for temperatures lower than (-)5°C ambient, a minimum of 10°C rise in	

		temperature within the tank must be effected.	
Desirable Parameters			
24	**Suspension**	Active Suspension System	
25	**Armour Material**	Light Wright, High Hardness Composite Material for complete construction including passive Armour.	
26	**Power to Weight Ratio**	30:1 (HP/Ton) and above	
27	**Camouflage**	Adaptive Camouflage	
28	**Embedded Training Module**	Obviate the requirement of simulators for tactical training. The module should enable use of tanks in training, utilising all capabilities including firing (firing lasers instead of actual ammunition along with measure to indicate 'hits'). Every utility should have an in-built training mode for learning and practising of the applicability.	
29	**Manned Unmanned Training**	Unmanned version capable of being remotely operated from a minimum distance of 500m. The remote operation system should be modular and reconfiguration onto multiple FRCVs. The reconfiguration should be achievable at 'O' level repair echelons.	

30	**Lethality**	(i) **KE (Kinetic Energy):** Depth of Penetration (DoP) greater than 800mm at 2000m at 60° Angle of Attack on a Rolled Homogeneous Armour (RHA) target.	
		(ii) **HEAT:** DoP greater than 1000mm at 2000m at 60° Angle of Attack on a RHA target.	
		(iii) **ATGM:** DoP should be minimum 1000mm on RHA at 6000m and capable of engaging targets at progressive ranges from 500m up to 6000m.	
		(iv) **LM:** Capable of housing and launch of LM from tank with minimum DoP of 600mm on RHA in top attack mode.	
31	**Stealth and Signature Management**	EM / Radar signature suppression by minimum 40%.	
32	**ATGM**	GLATGM (Gun Tube Launched Anti Tank Guided Missile)	

Signature & Seal:

Authorised Signatory of the Prospective Collaborator

Annexure-4

Reference List: The Prospective Collaborator shall furnish a summary of their product reference as detailed below for major supplies in last 15 years

SL No	Name of Country where Armoured Fighting Vehicle – Future Ready Combat Vehicle (AFV-FRCV) for Indian Army or similar Mobility Vehicle was supplied	No. of unit supplied	Year of Supply

Annexure-5

{To be printed and submitted on Prospective Collaborator's official letterhead}

EoI RESPONSE FORMAT

To,

Corporate Purchase

BEML Limited

SR Nagar, Bangalore 560027

E-mail: bemleoi@bemlltd.in

Dear Sir,

Ref: **Expression of Interest to collaborate with BEML Limited for Notice Inviting Expression of Interest (EoI) for technology tie up for Armoured Fighting Vehicle - Future Ready Combat Vehicle (AFV-FRCV) for Indian Army**

Having examined the Expression of Interest (EoI) document dated _____, downloaded from the BEML Limited website, i.e., www.bemlindia.in, we, the authorised signatories of the Prospective Collaborator, intend to submit the response/proposal to the aforesaid EoI document.

We attach hereto the response/proposal to EoI as required as per the EoI document, which constitutes our response to EoI.

Primary and Secondary contacts for our company are:

	Primary Contact	**Secondary Contact**
Company Name:		
Name:		
Title:		
Address:		
Phone:		
Mobile:		
Fax:		
E–mail:		

We confirm that the information contained in this response or any part thereof, including its exhibits, and other documents and instruments delivered or to be delivered to BEML Limited are true, accurate, verifiable and complete. This response includes all information necessary to ensure that the statements therein do not in whole or in part mislead BEML Limited in its short-listing process nor suppressed any material facts.

We fully understand and agree that on verification, if any of the information provided herein is found to be false /misleading, our response / proposal is liable to be disqualified / rejected from the selection process or termination of the definitive agreement, if the Prospective Collaborator is selected, besides other action as may be required as per the BEML Limited Purchase Manual.

We agree to the unconditional acceptance of all the terms and conditions set out in the EoI document.

It is hereby confirmed that I / We are entitled and duly authorised to act on behalf of the Prospective Collaborator and empowered and authorised to sign this document as well as such other documents, which may be required in this connection.

Dated this

(Signature)

(In the capacity of)

(Name)

Duly authorized to sign the EoI Response for and on behalf of:

(Name and Address of the authorised representative/signatory with Seal / Stamp of the Prospective Collaborator)

Witness Signature:

Witness Name:

Witness Address:

Annexure-6

{To be submitted in the letter head of the Prospective Collaborator}

CERTIFICATE AS TO AUTHORIZED SIGNATORIES

I, ……., the Company Secretary of ……, the Prospective Collaborator herein do hereby certify that Mr./Ms …… …… Who signed the EoI floated by BEML for technology tie up for Armoured Fighting Vehicle - Future Ready Combat Vehicle (AFV-FRCV) for Indian Army is authorized to do so and bind the company by authority of its board / governing body.

Date:

Signature:

(Company Seal)

Annexure-7

{To be submitted in the letter head of the Prospective Collaborator}

DECLARATION BY THE PROSPECTIVE COLLABORATOR

This is to certify that we, _____, the Prospective Collaborator herein do not have any litigation, arbitration cases or any litigation against BEML Ltd pending before any Court / Arbitrator in connection with any contract / tender issued by BEML Ltd.

Signature of Prospective Collaborator

(with Seal /Company Seal)

Annexure-8

{To be submitted in the letter head of the Prospective Collaborator}

DECLARATION BY THE PROSPECTIVE COLLABORATOR

This is to certify we _____ have not been banned / black listed / debarred by BEML / Central / State Govt. Dept. / Autonomous Institution / PSUs in India at the time of bid submission.

I / we hereby certify that all the information given above are true and correct.

Signature with date of Authorized signatory

Name: _____

Designation: _____

Firm's Seal:_____