



Bharat Heavy Electricals Limited
(A Government of India Undertaking)
Delhi – 110 049
India

Notice for Inviting
Expression of Interest (Eoi) for
Technology tie-up
for
Futuristic Infantry Combat Vehicle (Tracked) Gun Version for
Indian Army

Eoi Ref No.: BHEL/AA/TL/0112

Date: 28 Sept, 2023



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Combat Vehicle (Tracked) Gun Version for Indian Army**

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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 Bharat Heavy Electricals Limited (BHEL) or any of its employees 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 BHEL, its employees 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. BHEL, its employees 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. BHEL 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 BHEL is bound to select and shortlist any or all the Prospective Collaborator(s). Even after selection of suitable Prospective Collaborator, BHEL 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. BHEL 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, BHEL 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 BHEL rejects or annuls all the applications, it may at its discretion, invite all eligible Prospective Collaborators to submit fresh applications.
8. BHEL 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



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applicant fails to provide within the specified time, supplemental information sought by BHEL.

9. BHEL 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 BHEL shall not relieve the applicant of his obligations or liabilities hereunder nor will it affect any rights of BHEL.



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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
1.	Issue of Eoi document	28 Sept, 2023
2.	Last date of submission of Eoi response	28 Oct, 2023

B. Contact Details:

Senior Deputy General Manager (CTM)

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Bharat Heavy Electricals Limited (BHEL),
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SECTION – 3

Details of Expression of Interest (Eoi)

3.1 Introduction:

This Expression of Interest (Eoi) seeks response from the Prospective Technology Collaborator(s), who are willing to be associated with BHEL through a license & technology collaboration agreement for joint development of Futuristic Infantry Combat Vehicle (Tracked) Gun Version for Indian Army to enable BHEL to Design, Engineer, Manufacture, Assemble, Test, Supply, Field Install, Commission, Repair, Service and Retrofit.

Ministry of Defence, Govt of India intends to procure Futuristic Infantry Combat Vehicle (Tracked) Gun Version under Buy (Indian-IDDMM) Category of Chapter II of Defence Acquisition Procedure (DAP) 2020. Buy (Indian)-IDDMM 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>.

3.2 About BHEL:

BHEL is a leading state owned company, wherein Government of India is holding 63.17% of its equity. BHEL is an integrated power plant equipment manufacturer and one of the largest engineering and manufacturing organization in India, catering to the core infrastructure sectors of Indian economy viz. energy, transportation, heavy engineering industry, defense, renewable and non-conventional energy. The energy sector covers generation, transmission and distribution equipment for thermal, gas, hydro, nuclear and solar photo voltaic. BHEL has been in this business for more than 50 years and BHEL supplied equipment account for more than 57% (approx. 180 GW) of the total thermal generating capacity in India. BHEL has 16 manufacturing units, 4 power sector regions, 8 service centers and 15 regional offices besides host of project sites spread all over India and abroad. The annual turnover of BHEL for the year 2021-22 was around US \$2.6 Billion (Currency conversion rate considered: 1 US \$=Rs. 82.2 as on 31st March 2023).

BHEL's highly skilled and committed manpower of approx. 29000; state-of-the-art manufacturing, R&D facilities and latest technologies helped BHEL to deliver a consistent track record of performance since long. To position leading state-owned companies as Global Industrial giant and as a recognition for their exemplary performance, Government of India categorized BHEL as "Maharatna Company" in 2013. The high level of quality & reliability of BHEL products is due to adherence to international standards by acquiring and adapting



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some of the best technologies from leading companies in the world, together with technologies developed in its own R&D centers.

Our ongoing major technology tie-ups include agreements with Siemens Energy Global GmbH & Co. KG., Germany (for Steam Turbines, Generators and Condensers); MHI, Japan (for Flue Gas Desulfurization Systems); Leonardo S.p.A, Italy (for Super Rapid Gun Mount); GE Tech. GmbH, Switzerland (for Steam Turbine for Nuclear Power Plant and Gas Turbines); Vogt Power International, USA (for Heat Recovery Steam Generators); Indian Space Research Organization (ISRO), India (for Space Grade Lithium-Ion Cells); CSIR-IIP, India (PVSA based Medical Oxygen Plant); NANO Company Ltd., Korea (for SCR Catalysts); HLB Power Company Ltd., Korea (for Gates and Dampers); Kawasaki Heavy Industries, Japan (for Stainless Steel Coaches for Metros); Valmet Automation Oy, Finland (for DCS System), Babcock Power Environmental Inc., USA (for Selective Catalytic Reduction Systems) and Sumitomo SHI FW Energia Oy, Finland (for CFBC Boiler).

***More details about the entire range of BHEL's products and operations can be viewed by visiting our web site www.bhel.com**

3.3 BHEL in defence Sector :

BHEL presence in Defence business is more than three decades with proven track record of being competitive, adherence to quality, reliable supplies and life time product support. In the field of Defence, BHEL has long term association with Ministry of Defence (MOD) and key Indian Organisations viz. Indian Armed Forces, Defence Shipyards, DRDO Labs, HAL, erstwhile OFB, Indian Coast Guard for various projects including but not limited to the following -

1. Manufacture & supply 76/62 Super Rapid Gun Mount, since 1994, in collaboration with M/s Leonardo, Italy.
2. Integrated Platform Management System for Warships.
3. Manufactured and supplied Armored Recovery Vehicles to Indian Army
4. BHEL was part of development team for Main Battle Tank (BMT) Arjun and has integrated tanks & supplied Gun Control System for MBT Arjun.
5. Castings & Forgings for Defence and Strategic applications
6. Designed, engineered, manufactured and supplied Launchers for Trishul Missile & Brahmos Missiles
7. Designed, engineered, manufactured and supplied Permanent Magnet Based Motors & Frequency converters, Bidirectional converters, alternators, mechanical auxiliaries, Turbines, Turbo-generators, condensers for warship and submarines.



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8. One of select few firms worldwide with proven capability of design, engineering, manufacturing & testing of Compact Heat Exchangers & Pump Modules for Aerospace applications.
9. Long term association with various ISRO centres and is a regular manufacturer and supplier of Space Grade Li-ion cells & Batteries, Solar Panels for Satellites & Launch Vehicles, Hot forming of Titanium Shells/ Domes and Cryogenic Tanks.
10. Core capability for machining & fabrication of exotic materials including Al-alloys, Titanium alloys etc.

3.4 Scope of Cooperation:

BHEL is seeking Expression of Interest(s) from Prospective Collaborator(s) for Technology Collaboration Agreement (TCA) for joint development of Futuristic Infantry Combat Vehicle (Tracked) Gun Version for Indian Army.

The TCA shall enable BHEL to Design, Engineer, Manufacture, Assemble, Test, Supply, Field Install, Commission, Repair, Service and Retrofit Futuristic Infantry Combat Vehicle (Tracked) Gun Version for Indian Army.

Interested Parties meeting the PQR requirement as specified in clause 3.5 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, BHEL 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 Technology Collaboration Agreement (TCA) shall be held with shortlisted Prospective Collaborator(s). The detailed terms and conditions for such a paid-up license agreement shall be mutually agreed upon.

3.5 Prequalification 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 combat 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 combat vehicles (broad technical specifications at Annexure-3) and their designed equipment should have completed at least three (03) years of service as on date of closing of this Eoi.



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Note :

- i) Prospective Collaborator (s) shall take the responsibility for transfer of know how in the area of Design, Engineer, Manufacture and testing of Futuristic Infantry Combat Vehicle (Tracked) Gun Version for Indian Army to BHEL within the specified timeframe.

3.6 Instructions:

- 3.6.1** The interested Prospective Collaborator(s) should submit their response(s) along with enclosed annexures on or before **October 28, 2023**.

Annexure-1: Indicative Scope of Technology Transfer

Annexure-2: Prospective Collaborator's Experience in the field of Futuristic Infantry Combat Vehicle (Tracked) Gun Version for Indian Army

Annexure-3: General technical specifications of Futuristic Infantry Combat Vehicle (Tracked) Gun Version for Indian Army proposed for TCA

Annexure-4: Reference List: The Prospective Collaborator's major supplies in last 10 years

- 3.6.2** 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.

- 3.6.3 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.

- 3.6.4** The Prospective Collaborator(s) shall abide by the terms & conditions, as applicable, of the Eoi.

- 3.6.5** All pages of the response against this Eoi shall be duly signed by the authorised signatory.

- 3.6.6** Multiple proposals from the same Prospective Collaborator should not be submitted.

- 3.6.7** BHEL 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. BHEL decision in this regard shall be final.



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- 3.6.8** Any Prospective Collaborator which has been 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.
- 3.6.9** BHEL shall receive applications pursuant to this Eoi in accordance with the terms set forth herein, as modified, altered, amended and clarified from time to time by BHEL, 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.bhel.com

3.7 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 BHEL in processing of Eoi or selection decisions may result in the rejection of the response against Eoi.

3.8 GOVERNING LAWS & JURISDICTION:

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



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Annexure-1

Indicative Scope of Technology Transfer

(a)	Licensing & transfer of state of the art technology relating to Design, Engineer, Manufacture, Assemble, Test, Supply, Field Install, Commission, Repair, Service and Retrofit Futuristic Infantry Combat Vehicle (Tracked) Gun Version for Indian Army
(b)	Transfer of improvements/modifications/developments/up gradations 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 BHEL'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 BHEL engineers to Design, Engineer, Manufacture, Assemble, Test, Supply, Field Install, Commission, Repair, Service and Retrofit the Futuristic Infantry Combat Vehicle (Tracked) Gun Version for Indian Army.
(f)	Deputation of Collaborator's experts to assist BHEL 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 BHEL 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 BHEL to source/procure those items, which Prospective Collaborator sources from other vendors (as these are not manufactured by the Prospective Collaborator) for use in Futuristic Infantry Combat Vehicle (Tracked) Gun Version for Indian Army.

Signature & Seal:

Authorized Signatory of the Prospective Collaborator



Annexure-2

Prospective Collaborator's Experience in the field of Futuristic Infantry
Combat Vehicle (Tracked) Gun Version 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 Futuristic Infantry Combat Vehicle (Tracked) Gun Version for Indian Army or similar Combat Vehicle.	
(b)	Whether documentary evidence to substantiate the below PQRs has been submitted by Prospective Collaborator: The Prospective Collaborator should have designed, engineered, manufactured, tested, supplied and commissioned similar combat 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 combat vehicles (broad technical specifications at Annexure-3) and their designed equipment should have completed at least three (03) years of service as on date of closing of this EoI.	
(c)	Whether information on market share has been enclosed.	
(d)	Whether Prospective Collaborator's detailed reference list have been enclosed.	
(e)	Whether Prospective Collaborator's annual audited financial reports for last 3 years have been enclosed.	
(f)	Whether the Futuristic Infantry Combat Vehicle (Tracked) Gun Version for Indian Army or similar Combat Vehicle offered for technology collaboration is the latest being marketed by the Prospective Collaborator.	
(g)	Whether customers (end users) letters / documentary evidence for satisfactory operation of model for Futuristic Infantry Combat Vehicle (Tracked) Gun Version for Indian Army which is being offered to BHEL under this EoI have been enclosed.	



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(h)	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.	
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Signature & Seal:
Authorised Signatory of the Prospective Collaborator



Annexure-3

**General technical specifications of Futuristic Infantry Combat Vehicle (Tracked)
Gun Version for Indian Army proposed for TCA**

Operating Temperature	<p>(a) Plain and Desert Terrain</p> <ul style="list-style-type: none"> ○ Minimum Operating Temperature: Between 0° to 05° Celsius ○ Maximum Operating Temperature: Between 40° to 45° Celsius. <p>(b) High Altitude & Mountain Terrain</p> <ul style="list-style-type: none"> ○ Minimum Operating Temperature: Between (-)20° to (-)10° Celsius. ○ Maximum Operating Temperature: up to 40° Celsius
Weight	≤ 25 Ton with Combat Load
Power to Weight Ratio	At least 25 HP/Ton
Chassis	Tracked (Steel based tracks fused with rubber/ synthetic pads / bands for driving on tarmac roads)
Amphibious/Floatation capability	Yes (Hydro-jet type propulsion System)
Crew + Infantry Stick	03 + 08 members
Turret	<p>(a) 360° Traverse unlimited times in both directions</p> <p>(b) Integrate Main Gun, Co-axial Machine Gun, Anti-Tank Guided Missile, Remote Controlled Weapon Station and Sighting Systems</p>
Main Gun	<p>(a) Calibre ≥ 30 mm with co-axial Machine Gun ≥ 7.62 mm calibre</p> <p>(b) Automatic cannon with at least two-axis stabilisation on turret of FICV(Tr) and capable of single shot and burst firing</p> <p>(c) Max Elevation: at least 60°, Max Depression: at least 05° from level position</p> <p>(d) Type of Ammunition</p> <ul style="list-style-type: none"> ○ Armour Piercing Fin Stabilised Discarding Sabot with Tracer (APFSDS-T) ○ High Explosive Fragmentation Tracer with Impact Fuze (HEF-T) with self-destruct system ○ Target Practice with Tracer (TP-T) for APFSDS-T ammunition <p>(e) Maximum Range of Aimed Fire</p> <ul style="list-style-type: none"> ○ APFSDS-T: 2000m ○ HEF-T: 4000m
Firing Mode of Main Gun	<p>(a) Single Shot: 01 round with every press of trigger</p> <p>(b) Burst Fire: 03 rounds on one continuous press of trigger</p> <p>(c) Rapid Fire: At least 200 rounds per minute, Max of 40-60 rounds to be fired in one continuous press of trigger</p>



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	(d) Dual Fire Mode: In case of failure of main electric circuit, alternate means of firing should be provided to crew to fire in above three modes
Hit Probability of Main Gun	(a) APFSDS-T: At least 80% in Single Shot mode when fired at ranges between 1000m and 2000 m including when Target or Futuristic Infantry Combat Vehicle (Tracked) is moving laterally at a speed of at least 05 km/Hr. (b) HEF-T: At least 50% in Single Shot mode when fired at ranges between 2000m and 4000 m including when Target or FICV(Tr) is moving laterally at a speed of at least 05 km/Hr.
Anti-tank Guided Missile (ATGM) Launcher	(a) 02 Launchers with 04 reserve Anti-Tank Guided Missile (ATGM) (b) ATGM system to be integrated on turret (c) ATGM Capability: 'Lock-on-Before Launch' with 'Direct' & 'Top- Attack' (d) Hit Probability of ATGM at least 90% (e) Maximum Range of ATGM: not less than 4000 m (f) Minimum Range of ATGM: not more than 500 m (g) Minimum range of Top-attack of ATGM: not more than 1100m (h) Rate of Fire of ATGM: Gunner / Commander to be able to launch second ATGM within 15 seconds of firing first ATGM in same Field of View
Remote Control Weapon Station (RCWS)	(a) 12.7 mm Machine Gun on Remote Control Weapon Station (b) At least two-axis stabilised RCWS mounted on turret of Futuristic Infantry Combat Vehicle (Tracked) (c) 360° unlimited traverse in both directions, independent from Main Gun (d) Max Elevation: at least 60°, Max Depression: Aimed fire up to at least 50 meters from Futuristic Infantry Combat Vehicle (Tracked)
Communication	02 x Radio Sets
Auxiliary Power Unit (APU)	(a) On-board Auxiliary Power Unit (b) Based on Diesel (fuel may be drawn from vehicle), Fuel-Cell technology or Battery (battery may be charged from vehicle electric system)
Armour Protection	Any type / combination of armour / composite material to provide following protection:- (a) Frontal 120° Arc: Ballistic protection against at least 14.5 mm in service ammunition fired from 200 meters (b) Sides and Rear: Ballistic protection against at least 7.62 mm PKT in service AP ammunition fired from 30 meters (c) Top: Ballistic protection against at least 7.62 mm in-service rifle ammunition fired from 30 meters



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	<p>(d) Belly: Blast protection against at least 06 Kg explosive under center</p> <p>(e) Under Tracks: Blast protection against at least 08 Kg explosive under track</p> <p>(f) Provision for fitting add-on panels for additional protection</p>
Situational awareness System	An electro-optic based distributed system integrated to Fire Control System to provide day & night 360° vision around Futuristic Infantry Combat Vehicle (Tracked) under closed hatches to Commander, Driver and Stick Compartment independently.
Fire Control System (FCS)	<p>(a) Computer based Fire Control System</p> <p>(b) Integrate all Armaments, Sights, Remote Control Weapon Station, Laser Range Finders, Ballistic Computer, Ballistic Data of all ammunition, Automatic Target Tracker (ATT), Control Units for Anti-Tank Guided Missile, Gun Control Equipment, Armament Stabilisers, Meteorological Sensors, Vehicle parameters including speed, Navigation System, Situational Awareness System, Communication System, Laser Warning & Protection System (LWPS) and Active Protection System (APS) and display analysed / intelligent data on Visual Display Units</p>
Gun Control Equipment (GCE)	<p>(a) Electro-mechanical / electro-hydraulic powered Gun Control Equipment with manual back-up</p> <p>(b) Integrated with Fire Control System, Sights and Visual Display Units</p> <p>(c) Independent control device to both gunner and commander</p> <p>(d) Common Firing switch/ button for all armaments to be integrated on control device</p> <p>(e) Commander control device to have additional switch/buttons for operation of Remote Control Weapon Station and Over-ride Control</p>
Active Protection System	<p>(a) Protection against incoming Direct & Top-Attack ATGMs, Drones, LM and Rocket Propelled Grenades.</p> <p>(b) All round (360°) including Top-Attack (hemispherical) protection.</p>
Sighting Systems	<p>(a) Electronic Sights</p> <p>(b) Military Grade sights and Display Units.</p> <p>(c) Water and dust proof Protection</p> <p>(d) De-fogging and self-cleaning system</p>

Signature & Seal:

Authorized Signatory of the Prospective Collaborator



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Annexure-4

Reference List: The Prospective Collaborator shall furnish a summary of their product reference as detailed below for major supplies in last 10 years

Sl. No.	Name of Country where Futuristic Infantry Combat Vehicle (Tracked) Gun Version for Indian Army or similar Combat Infantry Vehicle was supplied	No. of unit supplied	Year of Supply