



EoI Ref No: AA/TL/0402

Date: 5th December 2019

Subject: Technology Tie-up for Light Weight Body Armours (Bullet Proof Jackets) for personnel protection

1) Introduction:

This Expression of Interest (EoI) seeks response from Original Equipment Manufacturers (OEM) of state-of-the-art Light Weight Body Armours (Bullet Proof Jackets), meeting the requirements of this EoI and willing to be associated with BHEL through a License & Technology Collaboration Agreement (TCA) on long term basis to enable BHEL to design, engineer, manufacture, assemble, test and supply Light Weight Body Armours (Bullet Proof Jackets) for Personnel protection applications to withstand the threat up to US National Institute of Justice (NIJ) level IV. OEMs shall ensure seamless transfer of technology to BHEL, which includes selection / identification of raw material (preferably sourced locally in India), specifying suitable processing methods & equipment enabling BHEL to manufacture Light Weight Body Armours (Bullet Proof Jackets) suitable for personnel protection applications and also provide technical support for testing and certification from authorized agencies.

1.1) About Bharat Heavy Electricals Limited (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, Defence, renewable and non-conventional energy. The energy sector covers generation, transmission and distribution equipment for hydro, thermal, nuclear and solar photo voltaic. BHEL has been in this business for more than 55 years and BHEL supplied equipment account for more than 57% of the total thermal generating capacity in India. BHEL is also listed in stock exchanges of India. The company has 16 Manufacturing Units, 2 Repair Units, 4 power sector regions, 8 service centers, 3 overseas offices and 15 regional offices besides host of project sites spread all over India and abroad. The annual turnover of BHEL for the year 2018-19 was ~US\$ 4 Billion. BHEL's highly skilled and committed manpower of approximately 35000 employees, the state of art manufacturing facilities and latest technologies, has helped BHEL to deliver a consistent track record of performance since long. To position leading state owned companies as Global Industrial giant & as a recognition for their exemplary performance, Government of India categorized BHEL as "Maharatna Company" in 2013, empowering the company with enhanced autonomy in decision making. With the current order book exceeding US\$ 15 Billion, BHEL is poised for excellent future growth. Our ongoing major technology tie-ups include agreements with GE Technology GmbH, Switzerland (for Once through Boilers and Coal Pulverisers); Siemens, Germany (for Steam Turbines, Generators and Condensers); Valmet Automation Oy., Finland (for Control & Instrumentation); MHI, Japan (for Pumps); MHPS, Japan (for Flue Gas Desulfurization Systems); Vogt Power International, USA (for HRSG); GENP, Italy (for Compressors); Turbo Lufttechnik, Germany (for Fans), ISRO (for Space Grade Lithium-Ion Cells), NANO Company Ltd., Korea (for SCR Catalysts), HLB Power Company Ltd., Korea (Gates and Dampers), Kawasaki Heavy Industries, Japan (for Stainless Steel Coaches for Metros), Babcock Power Environmental Inc., USA (for Selective Catalytic Reduction Systems) and Sheffield Forge Masters International, UK (for Forgings). More details about the entire range of BHEL's products and operations can be obtained by visiting our web site www.bhel.com.



1.2 Manufacturing Facilities at BHEL

BHEL has 16 manufacturing units, 2 Repair Units spanning across India equipped with state-of-the-art manufacturing facilities for manufacturing Power Plant Equipment, various Industrial products and Defence related Products. The high level of quality & reliability of BHEL products is due to adherence to international standards by acquiring and adapting some of the best technologies from leading companies in the world, together with technologies developed in its own R&D centres.

BHEL divisions viz. Manufacturing units, Engineering centres and Business Sectors viz. Power Sector, Industry sector, International Operations are accredited to Quality Management Systems (ISO 9001). Major Manufacturing units and Power Sector Regions are also accredited to Environmental Management Systems (ISO 14001) and Occupational Health & Safety Management Systems (OHSAS 18001).

1.2.1 Electric & Photovoltaic Division (EPD):

Strategic Business Unit for solar modules, ceramic products and systems of BHEL works under the banner of Electric & Photovoltaic Division (EPD). EPD is dedicated to the enhancement of business in solar modules, ceramics and its associated systems. This business unit manufactures solar modules, High tension Insulators, Ceramic wear resistant lined components & liners, Industrial ceramic products, LT Switchgear panels, Composite Insulators and associated systems. EPD has its headquarters at Bengaluru, Karnataka, India.

EPD has well established manufacturing systems & procedures and have requisite skilled and experienced manpower. The Units are certified for the Quality Management System against ISO-9001:2015 and Health, Safety & Environmental Management (HSE) System for ISO-14001:2004 & OHSAS-18001:2007. The financial turnover of EPD for the year 2018-19 was ~US\$ 50 Million and poised to grow further in the years to come. The products of EPD are tested and certified with respect to relevant National & Inter-National standards at reputed laboratories within the country and abroad. BHEL is the major supplier of Insulators and ceramic liners to all the power transmission utilities, railways and power equipment manufacturers in the country.

The operations of ceramics and other products are supported by Ceramic Technological Institute (CTI), Bengaluru a wing of BHEL Corporate R&D. CTI was established in 1989 with the aid of UNDP and is working on advanced Research and Development in Ceramics and allied fields.

1.2.2 Brief on Defence & Aerospace Business Group (DABG) of BHEL

BHEL has emerged as a reliable supplier of strategic equipment and services to Indian Defence forces for about three decades. BHEL has large infrastructure including dedicated engineering and manufacturing facilities at many locations to manufacture various types of equipment and provide complete services to meet the Indian defence requirements. BHEL has supplied to the defence forces 76/62 Super Rapid Gun Mount, Armoured Recovery Vehicle, Simulators, Control System for Tanks, Integrated Platform Management System for Ships, Casting and Forgings etc. Indian Navy and Indian Coast Guard, MoD, Govt. of India has nominated BHEL as the Production Agency for indigenous manufacture of 30 mm Naval Surface Gun in association with selected OEMs under Transfer of Technology.

In past BHEL has developed alumina based Bullet Proof Jackets for Indian Defence requirements.



2) Scope of cooperation:

BHEL presently is seeking Expression of Interest from OEMs of state-of-the-art Light Weight Body Armours (Bullet Proof Jackets) under License and Technology Collaboration Agreement for manufacturing of Light Weight Body Armours (Bullet Proof Jackets) for Personnel protection applications to withstand the threat up to NIJ level IV. Interested reputed OEMs with proven products for defense applications are invited to respond to this EoI.

Prospective Collaborator shall be responsible for transferring necessary know-how to enable BHEL to design, engineer, manufacture, assemble, test and supply the licensed product. BHEL intends to cater to domestic market in India as well as overseas markets.

Interested manufacturers meeting the Pre-Qualification Requirements (PQRs) are invited to submit their offer in response to this EoI. Indicative scope of technology transfer is stipulated in **Annexure-1**.

Upon receipt of responses against EoI from OEMs, BHEL will review the responses to ascertain suitability of the offer made by the Prospective Collaborator and shortlist the OEMs for further discussions. Detailed discussions on commercial and other terms and conditions to finalise the Technology Collaboration Agreement (TCA) shall be held with shortlisted parties.

Prospective Collaborator will be required to provide the samples as per IS 17051:2018 for testing at approved establishment in India.

The detailed terms and conditions for such a paid up license agreement shall be mutually agreed upon. Business sharing option, during the initial period of technology assimilation by BHEL can also be considered.

3) Prequalification requirements (PQR):

The Prospective Collaborator should meet all Pre-Qualification requirements as on the date of submission of EoI as mentioned below:

- a) Prospective Collaborator should have minimum of five (5) years of experience (as on closing date of EoI) of manufacturing Light Weight Body Armours (Bullet Proof Jackets) for personnel protection application.

AND

- b) Prospective Collaborator should have designed, engineered, manufactured and supplied at least 5000 number Light Weight Body Armours (Bullet Proof Jackets) to meet requirements for threat level NIJ level IV during last 5 years. (as on closing date of EoI). The supplies should meet the criteria of areal density (kg/m^2) as per threat Level 6 of Bureau of Indian Standards IS 17051:2018 table 6.

(Documentary evidence to substantiate the above including the Test certificates from Defense/Government approved Testing Agencies/ Labs to be produced)



4) Brief Description of EoI Process:

The interested Prospective Collaborators shall ensure that their complete duly filled up response along with following annexures are received by BHEL on or before **3rd January 2020, Friday**.

Annexure 1- Indicative Scope of Technology Transfer

Annexure 2- Broad Product & other details

Annexure 3- Experience in the field of Light Weight Body Armours (Bullet Proof Jackets):
Check List

Annexure 4- Detailed product reference for major supplies in last 5 years.

The response shall necessarily be accompanied with details on following:

1. Company Background
2. Product Profile
3. Data sheet of Light Weight Body Armours (Bullet Proof Jackets) along with its technical details
4. Reference list of Customers
5. Performance Certificates from customers / Testing Agency Certificates/ Reports and
6. Annual audited financial reports for last 3 (three) years including auditor's report.

In case any amendment/ corrigendum issued to this EoI, it shall be notified only at www.bhel.com

5) Schedule of EoI & Contact details:

5.1 Schedule of EoI:

The schedule of EoI shall be as follows:

S.No.	Description	Date
1	Issue of EoI Document	5th December 2019, Thursday
2	Due Date for submission of EoI response	3rd January 2020, Friday

5.2 Contact Details:

The respondent shall submit their offer with all annexures duly signed. Your response may be sent to the following address:

Dy. General Manager
Technology Licensing (TL)
Corporate Technology Management (CTM)
Bharat Heavy Electricals Limited
BHEL House, Siri Fort
New Delhi – 110049, India
Phone: +91 11 6633-7218/ 7220
Fax: +91 11 26492974
Email: techeoi@bhel.in;



6) Miscellaneous:

6.1.1 Right to accept or reject any or all Applications:

- a) 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 Prospective Collaborators to submit fresh applications.
- b) 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 applicant fails to provide within the specified time, supplemental information sought by BHEL.
- c) 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.

6.1.2 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.



Annexure-1

Indicative Scope of Technology Transfer

a)	Licensing & transfer of state of the art technology relating to raw materials selection, material recipe, Design, Engineering, Manufacturing, Assembly, Testing, Application support and knowhow of the Light Weight Body Armours (Bullet Proof Jackets) for personnel protection and other applications. The light weight Bullet Proof Jackets shall meet the latest relevant Indian and International standards such as i. Indian Standard on Bullet Resistant Jackets (IS 17051:2018) ii. Ballistic Resistance of Body Armor NIJ Standard Prospective Collaborator shall enable BHEL to meet the requirements of above mentioned standards through state-of-the-art and contemporary technology during the validity of the TCA.
b)	Support BHEL in establishing of plant for manufacturing of Light Weight Body Armours (Bullet Proof Jackets) by way of providing specifications of the intended equipment for manufacturing, in process testing and final product evaluation.
c)	Transfer of specifications of all raw materials, batch formulations and its basis, design, design calculations, manufacturing drawings, technical and quality surveillance assistance and supervision during manufacturing, assembly and testing of Light Weight Body Armours (Bullet Proof Jackets). This aspect shall also cover co-ordination with users of Bullet Proof Jackets and meeting their specific requirements. Further, shall assist in selection / identification of raw material preferably locally sourced including its testing, evaluation and adoption.
d)	Assistance in planning & establishing the new manufacturing, raw materials identification, sampling, testing, validation through batch trial for acceptance, raw materials processing, fabrication of Armour plates and jackets, process design and optimization, product acceptance testing, design and fabrication of tools & fixtures, manufacturing process optimization, performance testing and assembly facilities & processes / suitable augmentation at BHEL's existing facilities/processes by way of expert advice in terms of identifying, sizing & selection of equipment / machinery required for manufacturing, plant layout and testing and inspection facilities. Assistance for commissioning of the manufacturing facilities, design of special tools and dies, jigs & fixtures etc.
e)	Transfer of applicable and relevant knowledge, manuals, software / programs information pertaining to manufacture, assembly, and testing of Light Weight Body Armours (Bullet Proof Jackets).
f)	Transfer of improvements/modifications/developments/up gradations in line with the market requirements and introduction of new specifications / statutory requirements during the duration of TCA.
g)	Training of BHEL Engineers at collaborator's design office and manufacturing/ assembly facilities to enable them design, engineer, manufacture, assemble, quality control , test and application engineering of Light Weight Body Armours (Bullet Proof Jackets).
h)	Deputation of Collaborator's experts to assist BHEL in absorbing the technology for design, engineer, manufacture, quality control, assemble and test (including certification) Light Weight Body Armours (Bullet Proof Jackets) for personnel protection and other applications. Collaborators services may also be required at customer premises to assist BHEL Engineers.
i)	Support through engineering services from Collaborator's design office / manufacturing facilities
j)	Provide suitable assistance during tendering process in terms of preparation of techno-commercial offers, back-up bid guarantees (if required) etc.
k)	Provide assistance in getting requisite approval for engineering documents, electrical schematics and any other interface/ protocol drawings required, preparation of techno-commercial offers, approval of vendor for different components/subsystem etc.
l)	Provide assembly/integration manual including 3D models and animations, presentation material, technical brochures, sales promotion videos and marketing information.

(SIGNATURE)



Broad Product & other details to be submitted by Prospective Collaborators

a)	<p>Product Performance:</p> <ul style="list-style-type: none">• Applications: Body Armour, Vehicle Armour etc.• Protection levels of Soft Armour Panel (SAP) & Hard Armour Panel (HAP).• Threat level tested and certified from authorised agency• Type of bullets tested: Mild steel bullets/Hard steel bullet• Warranty/guarantee: Number of years for Hard panel/soft panel/outer jacket• Other significant features
b)	<p>Manufacturing & technical capabilities</p> <ul style="list-style-type: none">• Number of manufacturing plants• Year of installation of manufacturing plant• Capacity of each plant• Major facilities/equipments (Generic / Propriety)• Sources of raw materials (local/ global/ open market/ propriety)• Technology partnership/collaboration if any• Total strength of Engineering/ Technical personnel• Presence in India (if any)• IPR Owned (generated/ possessed)

(SIGNATURE)



Prospective Collaborator's Experience in the field of Light Weight Body Armours (Bullet Proof Jackets) : Check List

Sl. No.	Requirement	Prospective Collaborator's response YES/NO and remarks if any
a)	Whether Prospective Collaborator has its own manufacturing facility for 1) Body Armour 2) Bullet Proof Jackets or 3) Both	
b)	Whether Prospective Collaborator is having minimum of five (5) years (as on closing date of EoI) of experience of manufacturing Light Weight Body Armours (Bullet Proof Jackets) for personnel protection applications	
c)	Whether Prospective Collaborator has designed, engineered, manufactured and supplied at least 5000 number Light Weight Body Armours (Bullet Proof Jackets) for threat level NIJ level IV during last 5 years (as on closing date of EoI). Whether supplies meet the criteria of areal density (kg/m ²) as per threat Level 6 of Bureau of Indian Standards IS 17051:2018 table 6. If Yes, whether details have been enclosed.	
d)	Whether Prospective Collaborator has supplied Boron Carbide based Light Weight Body Armours (Bullet Proof Jackets) in past, If Yes, what are the numbers of such supplies in past 5 years.	
e)	Whether Prospective Collaborator has tested and got certifications for the Light Weight Body Armours (Bullet Proof Jackets).	
f)	Whether Prospective Collaborator has supplied Light Weight Body Armours (Bullet Proof Jackets) outside the country of prospective collaborator.	
g)	Whether Prospective Collaborator has experience of Setting up manufacturing plant for Light weight Body Armours (Bullet Proof Jackets).	
h)	Whether the Prospective Collaborator has any experience in transferring technology to other companies for establishing a new manufacturing, testing and assembly facilities, if so please specify.	
i)	Whether the Light Weight Body Armours (Bullet Proof Jackets) technology transfer offered is the latest being marketed by the Prospective Collaborator.	



Bharat Heavy Electricals Limited

Technology Licensing - Corporate Technology Management

Sl. No.	Requirement	Prospective Collaborator's response YES/NO and remarks if any
j)	Whether the Light Weight Body Armours (Bullet Proof Jackets) technology can be used for vehicle Armour or any other applications.	
k)	<p>Whether the Prospective Collaborator owns the Intellectual Property Rights for the technology being proposed for transfer under the Technology Collaboration Agreement (TCA) or Prospective Collaborator has an unencumbered right from the owner of the Intellectual Property Rights to sub-license the technology, if applicable. If yes,</p> <ul style="list-style-type: none">• whether list of such Intellectual Property Rights enclosed• Whether Prospective Collaborator agrees to transfer the Intellectual Property Rights to BHEL <p>Whether Prospective Collaborator agrees to enable BHEL to meet the above mentioned standards through state-of-the-art and contemporary technology during the validity of the TCA.</p>	
l)	Whether test certificates from authorised agencies are enclosed for the products for which the technology being offered as documentary proof to substantiate the PQR Prospective Collaborator	
m)	Whether Company background and its product profile is being offered to BHEL under this EoI enclosed.	
n)	Whether Product data sheets of Light Weight Body Armours (Bullet Proof Jackets) have been enclosed	
o)	Whether information on market share vis-a-vis has been enclosed	
p)	Whether Prospective Collaborator's customer reference list has been enclosed	
q)	Whether Prospective Collaborator's annual audited financial reports including auditor's report for last 3 years has been enclosed	
r)	Whether Prospective Collaborator is willing to provide the samples as per IS 17051:2018 for testing at approved establishment in India	

(SIGNATURE)



Annexure -4

Reference List: Detailed product reference for major supplies in last 5 years.

Sl. No	Client	Supply Date	Product type & Quantity supplied	Size of Weight Armours (Bullet Jackets)	Light Body Proof	Wt of Light Weight Body Armours (Bullet Proof Jackets)	Areal of Weight Armours (Bullet Jackets) Kg/m ²	Density of Light Body Proof in	Protection areas	Protection threat level	Certification details	Performance details	Other Remarks if any

(SIGNATURE)