



BHARAT HEAVY ELECTRICALS LIMITED
(A Government of India Undertaking)
DELHI - 110049

NOTICE FOR INVITING

Expression of Interest for Technology Collaboration Agreement
for Centrifugal Compressor for Petrochemical Sector

Reference number: AA/TL/0502

Date of Issue: 04.08.2021



Expression of Interest for Technology Collaboration Agreement for Centrifugal Compressors for Petrochemical Sector

Subject: Technology Collaboration for Centrifugal Compressors for Petrochemical Sector

1) Introduction:

This Expression of Interest (EoI) seeks response from Original Equipment Manufacturer (OEM) of Centrifugal Compressors for Petrochemical Sector viz. Cracked Gas Compressor, Ethylene Compressor, Propylene Compressor and other Compressors used in Petrochemical Sector, who are willing to be associated with BHEL through a license and technology collaboration agreement on long term basis to enable BHEL to design, engineer, manufacture, assemble, quality control, test, supply, install, commission, repair, service and retrofit such Centrifugal Compressors for Petrochemical Sector.

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 India's largest engineering and manufacturing enterprise of its kind, catering to the core infrastructure sectors of Indian economy viz. energy, transportation, heavy engineering industry, renewable & non-conventional energy and defence. The energy sector covers generation, transmission and distribution equipment for thermal, gas, hydro, nuclear and solar sector. BHEL has been in the business for more than 55 years and BHEL supplied power equipment account for more than 57% of the total thermal generating capacity in India. BHEL is also listed in both major stock exchanges of India. The company has 16 manufacturing units, 4 power sector regions, 8 service centers, 1 overseas office and 15 regional offices besides a host of project sites spread all over India and abroad. The annual turnover of BHEL for the year 2020-21 was around US \$ 2.35 Billion (Rs 17309 Cr). BHEL's highly skilled and committed manpower of around 31500 employees, the state-of-art manufacturing facilities and practices together with the latest technologies, have helped BHEL to deliver a consistent track record of performance. To position leading state-owned company as global industrial giant 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 \$ 14.85 Billion* (Rs. 109000 Cr), BHEL is poised for an excellent future growth.

Our ongoing major technology tie-ups include agreements with Siemens AG, Germany (for Steam Turbines, Generators and Condensers); MHI, Japan (for Pumps); MPL, Japan (for Flue Gas Desulfurization Systems); Oto Melara, Italy (for Super Rapid Gun Mount); GE Tec GmbH, Switzerland (for Steam Turbine for Nuclear Power Plant); Vogt Power International, USA (for Heat Recovery Steam Generators); Indian Space Research Organization (ISRO) (for Space Grade Lithium-Ion Cells); CSIR-IIP (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) and Babcock Power Environmental Inc., USA (for Selective Catalytic Reduction Systems). More details about the entire range of BHEL's products and operations can be obtained by visiting our website <http://www.bhel.com>.

2) BHEL's Credentials in compressor business:

BHEL through its manufacturing unit named Heavy Power Equipment Plant (HPEP) based at R.C. Puram, Hyderabad (State: Telangana) has been manufacturing various rating of centrifugal compressors for Refinery, Fertilizer, Steel, Gas Booster and other applications. HPEP also manufactures Steam Turbines, Gas Turbines, Heat Exchangers, Pumps, Generators, Bowl Mills and other products of strategic importance for core sectors.

Presently, BHEL manufactures complete range of centrifugal compressors for all major compression applications such as oil & gas production, gas transportation, refinery, fuel gas boosting and other similar processes. Compressors for services such as syngas, CO₂, air, ammonia, wet gas, H₂ recycle, natural gas have been supplied from BHEL. BHEL has the largest capability (VFD driven 8 MW electric motor drive) in the industry in India to perform tests under actual load and pressure conditions for compressor trains. BHEL has supplied more than 400 centrifugal compressors for various applications in India and abroad.

*1 USD to INR = 73.2065 as on 31st March, 2021

3) Scope of Cooperation:

In order to meet upcoming market requirements of Centrifugal Compressors for Petrochemical Sector viz. Cracked Gas Compressor, Ethylene Compressor, Propylene Compressor and other Compressors used in Petrochemical Sector in India and other countries, BHEL intends to enter into a Technology Collaboration Agreement (TCA) with a leading OEM.

BHEL is seeking responses from OEM of Centrifugal Compressors for Petrochemical Sector viz. Cracked Gas Compressor, Ethylene Compressor, Propylene Compressor and other Compressors used in Petrochemical Sector for technology transfer and collaboration on a long term basis to design, engineer, manufacture, assemble, quality control, test, supply, install, commission, repair, service and retrofit such Centrifugal Compressors for Petrochemical Sector. Main petrochemical units shall include, but not limited to, Dual Feed Cracker Unit, Poly-propylene Unit, Ethylene Recovery Unit, Propylene Oxide Unit, Ethylene Oil/Ethylene Glycol Unit, Paraxylene - Purified Terephthalic Unit etc.

Interested parties/prospective collaborator meeting requirement of this EoI are invited to respond to this EoI. Upon receipt of responses against EoI from the Prospective Collaborator, BHEL will review the responses to ascertain suitability of the offer made by the Prospective Collaborators and shortlist the parties for further discussions. Detailed discussions on commercial and other terms and conditions to finalise the TCA shall be held with shortlisted parties/Prospective Collaborators. The detailed terms and conditions for such a paid-up license agreement shall be mutually agreed upon.

Indicative scope of technology transfer for Centrifugal Compressors for Petrochemical Sector viz. Cracked Gas Compressor, Ethylene Compressor, Propylene Compressor and other Compressors used in Petrochemical Sector is given in **Annexure-1**.

4) Pre-Qualification Requirements (PQR):

The Prospective Collaborator shall meet the following conditions as on the last date of submission of this EoI (to be substantiated with relevant certificate(s)/ document):

4.1 The Prospective Collaborator should have experience in design, engineer, manufacture, test, package and supply each of the Centrifugal Compressor for Petrochemical Sector Viz. Cracked Gas Compressor, Ethylene Compressor and Propylene Compressor for process gas/service (Ethylene, Propylene etc.) within last ten (10) years.

AND

4.2 The Prospective Collaborator should have supplied minimum two (02) numbers of each of the following Centrifugal Compressor for Petrochemical Sector and out of these two (02) numbers, one (1) number of each compressor should have completed successful continuous operation for minimum 8000 hours:

4.2.1 Cracked Gas Compressor and Ethylene Compressor for Dual Feed Cracker Unit (DFCU) for plant capacity of 800 KTPA or above.

AND

4.2.2 Propylene Compressor for Poly-Propylene unit for plant capacity of 450 KTPA or above.



5) Brief Description of Eol Process:

The interested parties shall ensure that their response, along with details requested as per the following Annexures of this Eol, is received by BHEL on or before **24 August 2021**:

Annexure-1: Indicative Scope of Technology Transfer

Annexure-2: Prospective Collaborator experience in the field of Centrifugal Compressors for Petrochemical Sector

Annexure-3: Reference List

The response shall necessarily be accompanied with details on:

- i. Company background
- ii. Technical features/ latest product catalogue
- iii. Information on market share
- iv. General reference list for centrifugal compressor (as per API-617 chapter-2)
- v. Copy of annual audited financial reports for last three (03) years including copy of auditor's report etc.

BHEL at its discretion may extend the due date for submission of Eol and the decision of BHEL in this respect would be final & binding on the respondents.

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

6) Schedule of Eol & contact details:

6.1 Schedule of Eol:

The schedule of Eol shall be as follows:

Sl. No.	Description	Date
1.	Issue of Eol document	04.08.2021
2.	Last date for submission of Eol response	24.08.2021

6.2 Contact Details:

The respondent shall submit their response with all annexures duly signed to the following official:

Deputy General Manager (Technology Licensing)

Corporate Technology Management

Bharat Heavy Electricals Limited

BHEL House, Siri Fort

New Delhi – 110049, India

Phone: +91 11 66337339 / 7213

Mobile: +91 7838293011 / +91 9818103430

Fax: +91 11 26492974

Email: techeoi@bhel.in



7) Miscellaneous:

7.1 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. In the event that BHEL rejects or annuls all the applications, it may, at its discretion, invite all eligible OEMs/suppliers to submit fresh applications.
- b) BHEL reserves the right to disqualify any Prospective Collaborator(s) during or after completion of EoI process, if it is found there was a material misrepresentation by any such Prospective Collaborator(s) or the Prospective Collaborator(s) 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 Prospective Collaborator(s) in response to the EoI. Any such verification or lack of such verification by BHEL shall not relieve the Prospective Collaborator(s) of his obligations or liabilities hereunder nor will it affect any rights of BHEL.

7.2 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.

Indicative Scope of Technology Transfer

(a)	<p>Licensing & transfer of state of the art technology relating to the design, engineer, manufacture, assemble, quality control, test, supply, install, commission, repair, service and retrofit state of the art Centrifugal Compressors for Petrochemical Sector viz. Cracked Gas Compressor, Ethylene Compressor, Propylene Compressor and other Compressors used in Petrochemical Sector.</p> <p>Technology transfer should also include necessary inputs for design of auxiliary systems like lube oil, sealing system, baseplate, foundation design, instrumentation & control and any other applicable system for proper functioning of the compressor.</p>
(b)	<p>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.</p>
(c)	<p>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.</p> <p>Deputation of Collaborator's expert for commissioning of the manufacturing facilities, design of special tools and dies, jigs & fixtures etc.</p>
(d)	<p>Support through engineering services from Collaborator's design office / manufacturing facilities for licensed products.</p>
(e)	<p>Training of BHEL engineers in the design, engineering, manufacturing, assembly, quality control/quality assurance, testing, supply, installation, commissioning, maintenance, operation, repair, service and retrofit of the Centrifugal Compressors for Petrochemical Sector viz. Cracked Gas Compressor, Ethylene Compressor, Propylene Compressor and other Compressors used in Petrochemical Sector.</p>
(f)	<p>Deputation of Collaborator's experts to assist BHEL in absorbing the technology for licensed products.</p>
(g)	<p>Transfer of applicable proprietary software/computer programs including logics and source code, if any.</p> <p>Specification for necessary third party software and hardware required for design and engineering of the Centrifugal Compressors for Petrochemical Sector viz. Cracked Gas Compressor, Ethylene Compressor, Propylene Compressor and other Compressors used in Petrochemical Sector.</p>
(h)	<p>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.</p>
(i)	<p>Technology proposed should be the latest/ state-of-the-art being marketed by the Prospective Collaborator(s) for petrochemical applications.</p>
(j)	<p>Transfer of information to enable BHEL to source/procure those items, which Prospective Collaborator(s) sources from other vendors (as these are not manufactured by the Prospective Collaborator(s)) for use in the Centrifugal Compressors for Petrochemical Sector viz. Cracked Gas Compressor, Ethylene Compressor, Propylene Compressor and other Compressors used in Petrochemical Sector.</p>

(SIGNATURE)

Prospective Collaborator experience in the field of Centrifugal Compressors for Petrochemical Sector

Sl. No.	Requirement	Prospective Collaborator response YES/NO and remarks if any
(a)	Whether documentary evidence to substantiate the below PQRs has been submitted by Prospective Collaborator:	
	The Prospective Collaborator should have experience in design, engineer, manufacture, test, package and supply each of the Centrifugal Compressor for Petrochemical Sector viz. Cracked Gas Compressor, Ethylene Compressor and Propylene Compressor for process gas/service (Ethylene, Propylene etc.) within last ten (10) years.	
	The Prospective Collaborator should have supplied minimum two (02) numbers of each of the following Centrifugal Compressor for Petrochemical Sector and out of these two (02) numbers, one (1) number of each compressor should have completed successful continuous operation for minimum 8000 hours: <ul style="list-style-type: none"> i. Cracked Gas Compressor and Ethylene Compressor for Dual Feed Cracker Unit (DFCU) for plant capacity of 800 KTPA or above. AND ii. Propylene Compressor for Poly-Propylene unit for plant capacity of 450 KTPA or above. 	
(b)	Whether the Prospective Collaborator is an OEM of Centrifugal Compressors for Petrochemical Sector viz. Cracked Gas Compressor, Ethylene Compressor, Propylene Compressor and other Compressors used in Petrochemical Sector.	
(c)	Whether Prospective Collaborator has its own manufacturing facility for Centrifugal Compressors for Petrochemical Sector viz. Cracked Gas Compressor, Ethylene Compressor, Propylene Compressor and other Compressors used in Petrochemical Sector. If not, furnish details of where these Compressors are being manufactured.	
(d)	Whether Prospective Collaborator confirms its willingness to facilitate BHEL in establishing required manufacturing facilities for Centrifugal Compressors for Petrochemical Sector viz. Cracked Gas Compressor, Ethylene Compressor, Propylene Compressor and other Compressors used in Petrochemical Sector.	
(e)	Whether the Prospective Collaborator is an approved vendor of any process licensors for petrochemical plants. If yes, provide list of such process licensors.	
(f)	Whether the Prospective Collaborator owns the IPRs for the technology being proposed for transfer under the TCA or have unencumbered right from the owner of the IPRs to sub-license the technology, if applicable. If yes, list of such IPRs to be enclosed.	
(g)	Whether the Prospective Collaborator confirms the transfer of essential technology to BHEL to enable BHEL to design, engineer, manufacture,	



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Centrifugal Compressors for Petrochemical Sector

Sl. No.	Requirement	Prospective Collaborator response YES/NO and remarks if any
	assemble, quality control, test, supply, install, commission, repair, service and retrofit state of the art Centrifugal Compressors for Petrochemical Sector viz. Cracked Gas Compressor, Ethylene Compressor, Propylene Compressor and other Compressors used in Petrochemical Sector.	
(h)	Whether copy of Prospective Collaborator's detailed reference list for Centrifugal Compressor (as per API-617 chapter-2) enclosed.	
(i)	Whether details of company background, technical features/latest product catalogues enclosed.	
(j)	Whether copy of Prospective Collaborator's annual audited financial reports for last three (03) years enclosed.	
(k)	Whether information on market share enclosed.	
(l)	Whether the Prospective Collaborator has been blacklisted/banned for business dealings by any Ministry or any Government Department of India.	
(m)	Whether the Prospective Collaborator suffered bankruptcy / insolvency in the last ten (10) years.	
(n)	Whether any of the Prospective Collaborator's previous contract was terminated or part terminated due to bidder's failure.	

(SIGNATURE)

Disclaimer

The information contained in this EoI or subsequently provided to Prospective Collaborator(s), whether verbally or in documentary or any other form, by or on behalf of BHEL or any of its employees or advisors, is provided to Prospective Collaborator(s) on the terms and conditions set out in this EoI and such other terms and conditions subject to which such information is provided.

This EoI is not an agreement and is neither an offer nor invitation by BHEL to the Prospective Collaborator(s) or any other person. The purpose of this EoI is to provide interested Prospective Collaborator(s) with information that may be useful to them in the formulation of their application for qualification pursuant to this EoI.

BHEL also accepts no liability of any nature whether resulting from negligence or otherwise howsoever caused arising from reliance of any Prospective Collaborator(s) upon the statements contained in this EoI.

The issue of this EoI does not imply that BHEL is bound to select and shortlist Prospective Collaborator(s) or to enter into any technology tie-up agreements with shortlisted Prospective Collaborator(s).