



Expression of Interest (EoI) for Technology Collaboration Agreement (TCA)
for onshore AC Variable Frequency Drive Oil Drilling Rigs equipment

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

NOTICE FOR INVITING

**Expression of Interest (EoI) for Technology Collaboration
Agreement (TCA) for onshore AC Variable Frequency Drive Oil
Drilling Rigs equipment**

EoI No: BHEL/AA/TL/ 0506

Date of Issue: June 24, 2022

Last date for submission of EoI response: July 18, 2022

Disclaimer:

This EoI is not an agreement and is neither an offer nor invitation by BHEL to the respondents or any other person. BHEL accepts no liability of any nature whether resulting from negligence or otherwise howsoever caused arising from reliance of any respondent upon the statements contained in this EoI. The issue of this EoI does not imply that BHEL is bound to shortlist respondents for next stage or to enter into any formal agreement(s) with the respondent.



Expression of Interest (EoI) for Technology Collaboration Agreement (TCA) for onshore AC Variable Frequency Drive Oil Drilling Rigs equipment

EoI No: BHEL/AA/TL/0506

Date: June 24, 2022

Subject: Technology Collaboration for onshore AC VFD Oil Drilling Rigs

1) Introduction:

This Expression of Interest (EoI) seeks response from Original Equipment Manufacturer (OEM) of onshore AC Variable Frequency Drive (VFD) oil drilling rigs equipment, who are 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, quality control, test, supply, install, commission, repair, service and retrofit such onshore AC VFD oil drilling rigs equipment including but not limited to AC VFD draw works, AC VFD drives and controls (driller's control cabin & VFD house), AC top drive, hydraulically raised mast & substructure and 7500PSI, 1600HP mud pump.

1.1) About Bharat Heavy Electrical Ltd (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 India's largest engineering and manufacturing enterprise of its kind, catering to the core infrastructure sectors of Indian economy viz. energy, transportation, Oil & Gas, 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 and 4 regional offices besides a host of project sites spread all over India and abroad. The annual turnover of BHEL for the year 2021-22 was around US \$ 2.7 Billion (Rs 20153 Cr). BHEL's highly skilled and committed manpower of around 30500 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 Flue Gas Desulfurization Systems); Leonardo S.p.A, 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). For more details about the entire range of BHEL's products and operations please visit our website <http://www.bhel.com>.

1.2) About Heavy Power Equipment Plant (HPEP), Hyderabad and Heavy Electrical Plant (HEP), Bhopal:

HPEP, Hyderabad:

HPEP is one of the major manufacturing plants of BHEL located at R.C Puram, Hyderabad in the state of Telangana. This unit was established in the year 1965 for manufacturing of steam turbine and generator



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sets for state electricity boards and then diversified in to the areas of manufacturing gas turbines, pumps, heat exchangers, switch gears, pulverisers and oil rigs. Over the years, HPEP Hyderabad has supplied its products in Indian and overseas markets.

HEP, Bhopal:

The Heavy Electrical Plant (HEP) at Bhopal is one of the biggest unit of BHEL which started operations in 1960s. It is located in the capital city Bhopal of Madhya Pradesh, India. The unit manufactures a wide range of electrical products like switchgears, traction & industrial controls, transformers, capacitors, bushings, rectifiers & power electronics, heat exchangers, oil rig controls and DG sets, tap changers, thermal sets for power & industrial applications, hydro turbines & generators, traction machines, industrial machines etc. HEP, Bhopal is a pioneer in manufacturing of power transformers with manufacturing capacity of 30,000 MVA/annum with highest voltage class upto 800KV/1200kV.

2) Experience of BHEL in Rigs Business:

BHEL has established itself as an Original Equipment Manufacturer (OEM) for deep drilling rigs offering design, manufacturing and onsite services for various types of AC SCR land drilling rigs, mobile rigs and work over rigs. In last three decades, BHEL has supplied over 90 oil rigs and has carried out refurbishment and up gradation of more than 40 oil rigs so far. Key offerings of BHEL include onshore deep drilling rigs up to a depth of 9000 meters; mobile rigs up to a depth of 3000 meters; work-over rigs up to a well depth of 6100 meters; onshore drilling rig equipment like draw-works, rotary-table, travelling blocks, swivel, mast & substructure, mud-systems and rig electrics.

3) Scope of cooperation:

In order to meet upcoming market requirements and to have upgraded state-of-the-art technology for onshore AC VFD oil drilling rigs equipment, BHEL intends to enter into a TCA with a leading OEM. The TCA shall enable BHEL to design, engineer, manufacture, assemble, quality control, test, supply, install, erect, commission, repair, service and retrofit onshore AC VFD oil drilling rigs equipments including but not limited to AC VFD draw works, AC VFD drives and controls (driller's control cabin & VFD house), AC top drive, hydraulically raised mast & substructure and 7500PSI, 1600HP mud pump along with integration of all equipment related to onshore AC VFD oil drilling rigs equipment. The detailed terms and conditions for such a paid-up license agreement shall be mutually agreed upon.

Indicative scope of technology transfer for onshore AC VFD oil drilling rigs equipment is placed at **Annexure-1**.

4) Prequalification requirements (PQR):

The Prospective Collaborator shall meet all of the following conditions as on the date of submission of EoI (*To be substantiated by documentary evidence*):

- 4.1 The Prospective Collaborator must have valid API 8C license for top drive components (power swivel) and API 7K license for mud pump and draw works components.
- 4.2 The Prospective Collaborator must be an OEM for AC draw works (2000 HP or higher), AC top drive (500 Ton or higher) and AC VFD house & drilling control system for minimum 10 (ten) years. Main features of the drilling control systems include driller's chair with joystick and HMI software and corresponding hardware to control draw works, top drive, mud pump, VFD motors, power system).



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The Prospective Collaborator must have supplied at least 5 (five) sets of each of draw works (2000 HP or higher), top drive system (500 Ton or higher) and drilling control system (each set consisting of draw works, top drive and drilling control system) for drilling Rigs of 2000 HP or higher capacity in last 10 (ten) years to either oil exploration & production companies, drilling contractors or drilling service providers to oil and gas industry.

4.3 The Prospective Collaborator must be an OEM for 1600 HP or higher, 7500 PSI mud pump and must have supplied at least 5 (five) nos. in last 10 (ten) years to either oil exploration & production companies, drilling contractors or drilling service providers to oil and gas industry.

4.4 The Prospective Collaborator should also be a system integrator of equipment like iron rough neck, automated pipe racking system, hydraulic catwalk, centralized HPU, casing running tool, rig instrumentation, AC mud pump, hydraulic power slip, hydraulic cathead, hydraulic tongs, independent rotary drive system etc. and should have experience of integrating such systems at least 1 (One) numbers in last 10 (ten) years.

4.5 The Prospective Collaborator must be an OEM for hydraulically raised mast & hydraulic substructures (of minimum hook load capacity 1000 Kips) meant for onshore deep drilling rigs. The Prospective Collaborator must have manufactured and supplied at least 2 (two) numbers of hydraulic lift mast & substructures of hook load capacity 1000 Kips or higher in last 5 (five) years. API-4F certificate to be submitted for the facility from which 2 (two) sets of mast & substructure are supplied.

OR

The Prospective Collaborator should be a designer of mast & substructure having design capability for hydraulically raised mast & substructure. The Prospective Collaborator should have supplied minimum 2 (two) numbers of such mast & substructure of 1000 Kips or higher hook load capacity in last 5 (five) years bearing API 4F monogram (To be substantiated by experience list of contracts for rigs supplied in last 5 (five) years along with API-4F certificate of the manufacturer). A declaration from the manufacturer of mast & substructure to be submitted stating that their supplied mast & substructure is as per Prospective Collaborator's design.

5) Brief Description of EOI Process:

The interested parties shall ensure that their response, along with details requested as per the following Annexures of this EoI, is received by BHEL on or before **18th July 2022 (Monday)**:

Annexure-1- Indicative scope of technology transfer

Annexure-2- Prospective Collaborator experience in the field of AC VFD oil drilling rigs

Annexure-3- Essential technical features of AC VFD oil drilling rigs equipment proposed for TCA

Annexure-4- 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 in India/Globally
- iv. General reference list
- v. Copy of annual audited financial reports for last 3 (three) years including copy of auditor's report etc.

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

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



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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	24.06.2022
2.	Last date for submission of Eol response	18.07.2022

6.2 Contact Details:

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

Sr. 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
Email: techeoi@bhel.in

7) Miscellaneous:

7.1 Right to accept or reject any or all Applications:

7.1.1 Notwithstanding anything contained in this Eol, BHEL reserves the right to accept or reject any application and to annul the Eol 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 therefore. 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.

7.1.2 BHEL reserves the right to reject any applicant during or after completion of Eol 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.

7.1.3 BHEL reserves the right to verify all statements, information and documents submitted by the applicant in response to the Eol. 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.

7.2 Governing Laws & Jurisdiction

The Eol 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 Eol process.



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Annexure-1

Indicative Scope of Technology Transfer

1)	Licensing & transfer of state-of-the-art technology relating to design, engineer, manufacture, assemble, quality control, test, supply, install, commission, repair, service and retrofit of the onshore AC VFD oil drilling rigs equipment as specified in this EoI.
2)	Transfer of applicable computer programs including logics and source code, if any. Specification for necessary third party software and hardware required for design and engineering.
3)	Transfer of improvements/modifications/developments/upgradations carried out by the Prospective Collaborator over the duration of the technology transfer for taking care of new market requirements and obsolescence. Subsequent updates required due to component obsolescence or updates implemented by Prospective Collaborator due to safety consideration would also be provided.
4)	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 Prospective Collaborator's expert for commissioning of the manufacturing facilities, design of special tools and dies, jigs & fixtures etc.
5)	Transfer of site feedback and troubleshooting information.
6)	Training of BHEL engineers to design, engineer, manufacture, assemble, quality control, test, supply, install, commission, repair, service and retrofit onshore AC VFD oil drilling rigs equipment as specified in this EoI.
7)	Deputation of Prospective Collaborator's experts to assist BHEL in absorbing the technology for onshore AC VFD oil drilling rigs equipment as specified in this EoI.
8)	Technology proposed should be the latest/ state-of-the-art being marketed by the Prospective Collaborator.
9)	Support through engineering services from collaborator's design office / manufacturing facilities for onshore AC VFD oil drilling rigs equipment as specified in this EoI.
10)	Transfer of information to enable BHEL to source/procure those items, which the collaborator sources from outside (as these are not manufactured by the collaborator) for use in the onshore AC VFD oil drilling rigs.

(SIGNATURE)



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Annexure -2

Prospective Collaborator experience in the field of AC VFD oil drilling rigs

SN	Requirement	Prospective Collaborator's response YES/NO and remarks if any
1)	Whether the Prospective Collaborator is an OEM of following equipment of onshore AC VFD oil drilling rigs: <ul style="list-style-type: none"> a) AC VFD draw works b) AC VFD drives and controls (driller's control cabin & VFD house) c) AC top drive d) Hydraulically raised mast & substructure e) 7500PSI, 1600HP mud pump 	
2)	Whether Prospective Collaborator has its own manufacturing facility for: <ul style="list-style-type: none"> a) AC VFD draw works b) AC VFD drives and controls (driller's control cabin & VFD house) c) AC top drive d) Hydraulically raised mast & substructure e) 7500PSI, 1600HP mud pump If not, furnish details of where these components are being manufactured.	
3)	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.	
4)	Whether the Prospective Collaborator confirms the transfer of essential technology to BHEL to enable BHEL to design, engineer, manufacture, assemble, quality control, test, supply, install, commission, repair, service and retrofit onshore AC VFD oil drilling rigs equipment including but not limited to AC VFD draw works, AC VFD drives and controls (driller's control cabin & VFD house), AC top drive, hydraulically raised mast & substructure and 7500PSI, 1600HP mud pump.	
5)	Whether documentary evidence in support of following PQR enclosed:	
	a) The Prospective Collaborator must have valid API 8C license for top drive components (power swivel) and API 7K license for mud pump and draw works components.	
	b) The Prospective Collaborator must be an OEM for AC draw works (2000 HP or higher), AC top drive (500 Ton or higher) and AC VFD house & drilling control system for minimum 10 (ten) years. Main features of the drilling control systems include driller's chair with joystick and HMI software and corresponding hardware to control draw works, top drive, mud pump, VFD motors, power system). The Prospective Collaborator must have supplied at least 5 (five) sets of	



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	<p>each of draw works (2000 HP or higher), top drive system (500 Ton or higher) and drilling control system (each set consisting of draw works, top drive and drilling control system) for drilling Rigs of 2000 HP or higher capacity in last 10 (ten) years to either oil exploration & production companies, drilling contractors or drilling service providers to oil and gas industry.</p>	
	<p>c) The Prospective Collaborator must be an OEM for 1600 HP or higher, 7500 PSI mud pump and must have supplied at least 5 (five) nos. in last 10 (ten) years to either oil exploration & production companies, drilling contractors or drilling service providers to oil and gas industry.</p>	
	<p>d) The Prospective Collaborator should also be a system integrator of equipment like iron rough neck, automated pipe racking system, hydraulic catwalk, centralized HPU, casing running tool, rig instrumentation, AC mud pump, hydraulic power slip, hydraulic cathead, hydraulic tongs, independent rotary drive system etc. and should have experience of integrating such systems at least 1 (One) numbers in last 10 (ten) years.</p>	
	<p>e) The Prospective Collaborator must be an OEM for hydraulically raised mast & hydraulic substructures (of minimum hook load capacity 1000 Kips) meant for onshore deep drilling rigs. The prospective Collaborator must have manufactured and supplied at least 2 (two) numbers of hydraulic lift mast & substructures of hook load capacity 1000 Kips or higher in last 5 (five) years. API-4F certificate to be submitted for the facility from which 2 (two) sets of mast & substructure are supplied.</p> <p align="center">OR</p> <p>The Prospective Collaborator should be a designer of mast & substructure having design capability for hydraulically raised mast & substructure. The Prospective Collaborator should have supplied minimum 2 (two) numbers of such mast & substructure of 1000 Kips or higher hook load capacity in last 5 (five) years bearing API 4F monogram.</p>	
6)	<p>Whether Prospective Collaborator confirms its willingness to facilitate BHEL in establishing required manufacturing facilities.</p>	
7)	<p>Whether the Prospective Collaborator is an approved vendor of any oil exploration & production companies, drilling contractors or drilling service providers to oil and gas industry.</p> <p>If yes, provide list of companies/contractors etc.</p>	
8)	<p>Whether details of company background, product catalogues enclosed.</p>	
9)	<p>Whether information on market share in India/globally enclosed.</p>	
10)	<p>Whether the Prospective Collaborator detailed reference list enclosed.</p>	



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11)	Whether Prospective Collaborator's annual audited financial reports for last 3 (three) years enclosed.	
12)	Whether the Prospective Collaborator has been blacklisted/banned for business dealings by any Ministry or any Government Department of India.	
13)	Whether the Prospective Collaborator suffered bankruptcy / insolvency in the last ten (10) years.	
14)	Whether any of the Prospective Collaborator's previous contract was terminated or part terminated due to bidder's failure.	
15)	Whether API license certificate for monogramming the 4F, 7K and 8C product submitted.	

(SIGNATURE)



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Annexure -3

Essential technical features of AC VFD oil drilling rigs equipment proposed for TCA

Sl. No	Technical Feature	Yes or No	Remarks if any
1)	Gear driven 2000 HP AC draw works with disc brake suitable for automated drilling system.		
2)	AC-VFD drives for draw works, mud pump, top drive & rotary drive with regenerative braking feature and integrated control system for power generation.		
3)	Central drilling controls system (SBC/PLC based) for draw works, mud pumps, top drive, independent rotary drive and other rig accessories.		
4)	Drillers control cabin equipped with joy stick and HMIs.		
5)	1600 HP, 7500 PSI working pressure AC mud pump.		
6)	Hydraulically raised/lowered mast and sub structure (1000 Kips static hook load capacity).		

(SIGNATURE)



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Annexure -4

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

SN	Equipment name	Capacity	Project name	Location (Country name)	Year of supply	Manufactured by Prospective Collaborator or bought out item
1)	Draw works					
2)	Top drive					
3)	Drilling Control system					
4)	Hydraulic raised/lowered mast & substructure					
5)	Mud Pump					
6)	AC VFD House					

(SIGNATURE)