



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

NOTICE FOR INVITING

Expression of Interest for selection of partner for
undertaking design development, manufacturing, assembly,
testing of Electric Propulsion System for Indian Navy ships
under Make-1/ IDDM category of Defence Acquisition
Procedure 2020

Eoi No: BHEL/AA/TL/ 0408

Date of Issue: July 20, 2022

Last date for submission of Eoi response: Aug 10, 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 selection of partner for Electric Propulsion System of Indian Navy Ships

Eoi No: BHEL/AA/TL/0408

Date: July 20, 2022

Subject: Selection of partner for undertaking design development, manufacturing, assembly, testing of Electric Propulsion System for Indian Navy ships under Make-1/IDDM category of Defence Acquisition Procedure 2020

1) Introduction:

This Expression of Interest (Eoi) seeks response from Original Equipment Manufacturer (OEM) of Electric Propulsion System for naval ships, who are willing to be associated with BHEL for undertaking design development, manufacturing, assembly, testing of Electric Propulsion System for Indian Navy ships as under Make-1/ IDDM category of Defence Acquisition Procedure (DAP) 2020.

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 sectors of Indian economy viz. energy, transportation, oil & gas, heavy engineering industry, renewable & non-conventional energy and defence etc. 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);



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Indian Space Research Organization (ISRO) (for Space Grade Lithium-Ion Cells); CSIR-IIP (PVSA based Medical Oxygen Plant); NANO Co. 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 Electrical Plant (HEP), Bhopal and Heavy Power Equipment Plant (HPEP), Hyderabad:

HEP, Bhopal: HEP is one of the biggest unit of BHEL, which started operations in 1960s. 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.

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 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.

2) Experience of BHEL in Electric Propulsion Business:

BHEL presence in Defence business is more than three decades old, with proven track record of being competitive, adherence to quality, reliable supplies and life time product support. BHEL has developed expertise in technology absorption, assimilation and upgradation for variety of equipment and systems with a dedicated Research and Development (R&D) Centre and has set-up 14 Centre of Excellence to carryout research in specialised areas for meeting challenges of present and future business environment.

BHEL's R&D division is already working with DRDO/ Indian Armed Forces to achieve self-reliance in strategic program of Indian Navy. BHEL capability in Motors, Alternators, Switchboards, Controllers, Inverters/ Converters, Drives, Circuit Breakers, Transformers, Gearbox, etc. can be leveraged for design & development of Electric Propulsion System.



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3) Scope of cooperation:

In order to meet upcoming market requirements and to have upgraded state-of-the-art technology for Electric Propulsion system for Naval ships, BHEL intends to enter into a partnership agreement for undertaking design development, manufacturing, assembly, testing of Electric Propulsion System for Indian Navy ships as per requirement under Make-1/ IDDM category of DAP with a leading OEM.

The partnership agreement should enable BHEL to undertake System design, Sub-Systems design and Equipment/Component design, manufacture, assemble, quality control, test, supply, install, commission, repair and service of Electric Propulsion System for Indian Navy ships.

Sub-Systems design and Equipment/Component-design of Electric Propulsion System for naval ships is not limited to, but typically consist of the following:

- a) Electrical equipment consisting of switchboards, harmonic filters & EMI/EMC etc.
- b) Power electronics – Propulsion drives, Filters, Converters, Auxiliary drives etc.
- c) Marine grade EMI/EMC compatible Rotating Electrical machines
- d) Automation & Systems - Power management, ship management, Damage, positioning, warfare, diagnostic etc.

BHEL also seeks long term support/handholding & collaboration from prospective OEM through Indigenization and Business development for complete fully integrated Electric power & propulsion for naval ships.

The detailed terms and conditions for such agreement shall be mutually agreed upon. Indicative scope of technology partnership for Electric Propulsion system for Indian Navy ships is placed at **Annexure-1**.

4) Prequalification requirements (PQR):

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

- 4.1 The Prospective Collaborator must be an Original Equipment Manufacturer (OEM) who has successfully undertaken system design, development, manufactured/got manufactured, test, supply, installation and commissioning of major electrical equipment which forms part of Electric Propulsion System viz Propulsion Motors, AC Drives, Filters, Switchboards, Converters, Automation & control systems etc.



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- 4.2 The Prospective Collaborator must have supplied minimum 5 MW power rating Naval Grade shock proven propulsion motors and associated systems described above for Naval ships (Frigate/Destroyer/Aircraft Carrier/Amphibious/Auxiliary class).
- 4.3 The Prospective Collaborator must have experience of system design, design of sub systems, development, manufactured/got manufactured, test, supply, installation & commissioning of Electric Propulsion System for at least one Naval Ship (Frigate/Destroyer/ Aircraft Carrier/Amphibious/Auxiliary class).
- 4.3 The Prospective Collaborator must have supplied at least one electric propulsion system for Naval ships in last ten years, which should have been in satisfactory operation for at least two (02) years.

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 **Aug 10, 2022 (Wednesday)**:

Annexure-1: Indicative scope of technology partnership

Annexure-2: Prospective Collaborator experience in the field of Electric Propulsion system for Naval Ships

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 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 is as follows:

Sl. No.	Description	Date
1.	Issue of Eol document	July 20, 2022
2.	Last date for submission of Eol response	Aug 10, 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, 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.



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7.1.3 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.

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

1)	Should be ready to Partner with BHEL for undertaking design development, manufacturing, assembly, testing of Electric Propulsion System for naval ships as per requirement of Indian Navy under Make-1/ IDDM category of DAP state-of-the-art technology.
2)	Should be willing to share design & performance calculation of the System/sub-systems/ equipment which forms part of the Electric Propulsion system for Naval ships.
3)	Should provide necessary support to BHEL for undertaking System Integration & Testing.
4)	Providing necessary support in the form of system design, its sub-system design, performance calculation methods to enable designing of the complete electric propulsion system for naval ships with shaft power ratings upto 85 MW.
5)	Transfer of applicable computer programs developed which is proprietary in nature (if any), along with Logics & Source Code for design of equipment, its sub-system & assemblies. Sharing of specification for necessary third party software and hardware required for undertaking design and development.
6)	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 should also be provided. 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.
7)	Transfer of site feedback and troubleshooting information on Electric Propulsion system for Naval ships.
8)	Training of BHEL engineers to provide training to BHEL engineers at the Prospective Collaborator's works on design, manufacturing, testing, quality control, installation & commissioning, debugging, operation and maintenance on equipment & sub-systems as specified in this EoI.
9)	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, prospective vendor etc. Deputation of Prospective Collaborator's expert for commissioning of the manufacturing facilities, design of special tools and dies, jigs & fixtures etc.



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10)	Deputation of Prospective Collaborator's experts to assist BHEL in absorbing the technology & visit to BHEL works during manufacture of propulsion sub components as specified in this EoI.
11)	Support through engineering services from collaborator's design office/manufacturing facilities for trouble shooting, servicing, maintenance, overhaul & technical issues reported from Client & during manufacturing at BHEL Works.
12)	Providing details of the manufacturing processes, drawings, design & material specifications of sub-components & assemblies, quality control, inspection requirements and vendor list for the said designs.
13)	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 equipment and sub-system specified in this EoI by means of Drawing / specifications with BOM, Inspection requirements, acceptance norms etc. along with vendor details for the same.

(SIGNATURE)



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Annexure -2

Prospective Collaborator experience in the field of Electric Propulsion system for Naval Ships

SN	Requirement	Prospective Collaborator's response YES/NO and remarks if any
1)	Whether the Prospective Collaborator is an Original Equipment Manufacturer of Electric Propulsion system for Naval Ships.	
2)	Whether Prospective Collaborator has its own manufacturing facility for: I. Electrical equipment consisting of switchboards, harmonic filters etc. II. Power electronics – Propulsion drives, Filters, Converters, Auxiliary drives etc. III. Rotating Electrical machines IV. Automation & Systems- Power management, ship management, Damage, positioning, warfare, diagnostic etc. 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 documentary evidence in support of following PQR enclosed: The Prospective Collaborator, a. must be an Original Equipment Manufacturer (OEM) who has successfully undertaken system design, development, manufactured/got manufactured, test, supply, installation and commissioning of major electrical equipment which forms part of Electric Propulsion System viz Propulsion Motors, AC Drives, Filters, Switchboards, Converters, Automation & control systems etc. b. must have supplied minimum 5 MW power rating Naval Grade shock proven propulsion motors and associated systems described above for Naval ships (Frigate/Destroyer/Aircraft Carrier/Amphibious/Auxiliary class).	



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	<p>c. must have experience of system design, design of sub systems, development, manufactured/got manufactured, test, supply, installation & commissioning of Electric Propulsion System for at least one Naval Ship (Frigate/Destroyer/ Aircraft Carrier/Amphibious/Auxiliary class).</p> <p>d. must have supplied at least one electric propulsion system for Naval ships in last ten years, which should have been in satisfactory operation for at least two (02) years.</p>	
5)	Whether Prospective Collaborator confirms its willingness to facilitate BHEL in establishing required manufacturing facilities and processes at BHEL.	
6)	Whether the Prospective Collaborator abandoned any work in the last ten (10) years.	
7)	Whether the Prospective Collaborator suffered bankruptcy/ insolvency in the last ten (10) years.	
8)	Whether the Prospective Collaborator certified that no agent/ middleman has been or will be engaged or any agency commission been or will be paid.	
9)	Whether the Prospective Collaborator confirmed 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 state of the art Electric Propulsion System of Naval ships.	
10)	Whether details of company background, product catalogues enclosed.	
11)	Whether information on market share in India/globally enclosed.	
12)	Whether the Prospective Collaborator detailed reference list enclosed.	
13)	Whether Prospective Collaborator's annual audited financial reports for last 3 (three) years enclosed.	
14)	Whether the Prospective Collaborator has been blacklisted/banned for business dealings by any Ministry or any Government Department of India.	
15)	Whether any of the Prospective Collaborator's previous contract was terminated or part terminated due to bidder's failure.	

(SIGNATURE)



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Annexure -3

Reference List: The Prospective Collaborator shall furnish summary of complete Electric Propulsion System of Indian Navy Ships/major equipments supply references 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)						
2)						
3)						
4)						
5)						
6)						
7)						
8)						
9)						
10)						

(SIGNATURE)