BHARAT HEAVY ELECTRICALS LIMITED

(A Government of India Undertaking)

Delhi – 110049

India

Notice for Inviting

Expression of Interest (EOI) from global players

for

Strategic Tie-up / Business Sharing Agreement

for

Static Frequency Converter (SFC) / Load Commutated Inverter (LCI)

for

Synchronous Machines

EOI Ref No. BHEL/EDN/SFC/2026/01 Rev.00

Date: 06.05.2026

Index

SECTION-1

DISCLAIMER

The information contained in this Expression of Interest (EoI) document provided to the OEM, by or on behalf of Bharat Heavy Electricals Limited (BHEL) or any of its employees or advisors, is provided to the OEM 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 OEM with information to assist the formulation of their proposal. This EoI document does not purport to contain all the information each OEM 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 OEM who reads or uses this EoI document. Each OEM 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 OEM(s). Selection of a OEM does not obligate BHEL to proceed further, and no commercial or consequential liability shall arise on BHEL.

5. The OEM 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 OEM 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 OEM(s) 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 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 affects any rights of BHEL.

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	07.05.2026
2.	Last date for submission of responses against the EoI via e-mail to ednsfceoi@bhel.in	01.06.2026 – Extension up to 22.06.2026 – 2nd Extension up to 08.07.2026

B. CONTACT DETAILS

Additional General Manager
CE-Engg./Drives
Bharat Heavy Electricals Limited (BHEL)
Electronics Division, Bengaluru – 560026
Tel : +91-80-2699-8797 / +91-80-2699-8143
Mobile : +91-9901522011 / 9886118855
E-Mail:ednsfceoi@bhel.in, subbalakshmi@bhel.in, giteshdas@bhel.in

SECTION-3

DETAILS OF EXPRESSION OF INTEREST (EoI)

3.1 INTRODUCTION

BHEL seeks Expression of Interest from OEM of Static Frequency Converter (SFC) / Load Commutated Inverter (LCI) for Synchronous Machines, who are meeting the requirements of this EoI and are willing to be associated with BHEL through a Strategic Tie-Up/ Business Sharing Agreement (BSA) to enable BHEL to meet the new supplies and retrofit requirements (of LCI) for Synchronous Machines as per potential market requirements.

For the purpose of this EoI, the term Original Equipment Manufacturer (OEM) refers to SFC/LCI drive manufacturers who own the technology and Intellectual Property Rights (IPRs).

3.2 ABOUT BHEL:

BHEL is a leading state-owned company, wherein Government of India is holding ~58% of its equity. BHEL is an integrated power plant equipment manufacturer and one of the largest engineering and manufacturing enterprise in India, catering to the core infrastructure sectors of Indian economy viz. energy, transportation, and heavy engineering industry, defence, renewable and non-conventional energy. The energy sector covers generation, transmission and distribution of equipment for thermal, gas, hydro, nuclear and solar photo voltaic power plant. BHEL has been in this business for more than 50 years and BHEL supplied equipment account for approx. 200 GW of the total thermal generating capacity in India. BHEL is also listed in Indian stock exchanges. BHEL has 16 manufacturing units, 2 repair units, 4 regional offices, 8 service centres and 15 regional marketing centres besides host of project sites spread all over India and abroad. BHEL has its footprint in all the inhabited continents with references in 89 countries including Malaysia, Oman, Iraq, Syria Sudan, Libya, Cyprus, Malta, Afghanistan, Bangladesh, Bhutan, New Zealand etc. The cumulative overseas installed capacity of BHEL manufactured power plants nearing 10,000 MW. The annual turnover of BHEL for the year 2025-26 was around US$ 3.43 Billion*. BHEL's highly skilled and dedicated workforce of approximately 27,231 employees; 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 some of the best technologies from leading companies in the world, together with technologies developed in its own R&D centres. Our ongoing major technology partnership include agreements with Siemens Energy Global GmbH & Co. KG., Germany (for Steam Turbines, Generators and Condensers); Mitsubishi Heavy Industries Ltd., Japan (for Flue Gas Desulfurization Systems); Leonardo S.p.A, Italy (for Super Rapid Gun Mount); GE Technology GmbH, Switzerland (for Steam Turbine for Nuclear Power Plant and for Gas turbines); 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 Ltd., Japan (for Stainless Steel Coaches for Metros); Valmet Automation Oy, Finland (for DCS System); Babcock Power Environmental Inc., USA (for Selective Catalytic Reduction Systems); Sumitomo SHI FW Energia Oy., Finland (for Circulating Fluidized Bed Combustion Boilers); HIMA Middle East FZE, Dubai (for KAVACH System/Train Collision Avoidance System); Bhabha Atomic Research Centre (BARC) (for 50 kW Alkaline Water Electrolyser System for Hydrogen Production) and most recently with E2S, Korea (for Digital AVR System).

***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 MARKET IN INDIA:

In addition to emerging Synchronous Condenser applications at scale and large Desalination plants, the country aspires to add another 54 GW of power generating capacity within next 05 years in the area of Pump Storage Plants. The customers in India, however, generally insist for proven equipment by specifying in the qualification requirements of the tender.

3.4 ABOUT ELECTRONICS DIVISION (EDN):

The Electronics Division (EDN) (www.bheledn.com) of BHEL has been operating in the areas of Automation and Power Electronics since 1976. Most of the power plants and industries in the country today are equipped with electronic products and systems which have been manufactured and supplied by BHEL EDN. BHEL also has a good international reference by way of exports to European, Middle-East and South-East Asian markets. BHEL EDN has been accredited with ISO 9001, ISO 27001, ISO 14001 and OHSAS 18001 standard certifications.

As part of Power Plant automation, BHEL-EDN has been manufacturing Load Commutated Inverters of ID Fan Motor controls of Thermal Power Plants and Static Frequency Converters for Lift Irrigation projects from 1980's. These were manufactured at BHEL-EDN and commissioning was done by BHEL.

3.5 SCOPE OF COOPERATION:

BHEL is seeking Expression of Interest (EoI) from OEM with established and proven technology for Strategic Tie-Up / Business Sharing Agreement (BSA) for latest & proven technology of Static Frequency Converter (SFC) / Load commutated Inverter (LCI) for Synchronous Machines. The ratings of SFC's/LCI's being considered is from 3 MW to 50MW.

The partnership will be structured to evolve progressively, aligned with the success and scale of business achieved through mutual cooperation. The partnership will follow a phased-indigenisation approach:

• Phase 1 – SKD (Initial Deployment Phase)

OEM shall supply SFC/LCI systems in SKD condition with factory-assembled and tested modules/sub-assemblies.

BHEL scope shall include installation, interconnection, integration, and system-level testing, with OEM support for supervision, training, and commissioning.

This phase shall focus on system familiarization, execution readiness, and initial project delivery.

• Phase 2 – CKD (Localization & Capability Development Phase)

OEM shall progressively transition supply to CKD condition, enabling BHEL to undertake component/module level manufacturing (where applicable), PCB population, mechanical assembly, electrical interconnection, integration, and testing.

OEM shall provide complete technical documentation, training, and process know-how to support this transition.

Supply shall progress from SKD to CKD in a phased manner, with increasing localization over time. The phase-wise transition, timelines, and scope shall be mutually agreed and defined as part of the final agreement.

The OEM shall also:

- Support BHEL in installation, commissioning, testing, QA, troubleshooting, and after-sales service.
- Provide inputs for setting up BHEL's manufacturing, assembly, and test facilities.

Responses to this EoI shall be submitted in accordance with the terms defined herein and as may be modified, amended, or clarified by BHEL from time to time. Applications must be submitted before the specified deadline.

Upon receipt of responses, BHEL will assess the suitability of the proposals and shortlist OEM for further discussions. Detailed deliberations on commercial, technical, and other terms will follow to finalise the Strategic Tie-up / BSA. The final terms and scope of the agreement shall be mutually agreed upon between BHEL and the selected OEM.

3.6 PREQUALIFICATION REQUIREMENTS (PQR):

The OEM shall meet the following qualification requirements as on the final date of submission of this EoI:

a) The OEM shall have an experience of minimum 10 years in the design, engineer, manufacture and installation of Static Frequency Converter (SFC) / Load Commutated Inverter (LCI)

AND

b) The OEM shall have designed, engineered, manufactured, erected and commissioned (Erection & Commissioning could be directly or through associates) Static Frequency Converter (SFC) / Load Commutated Inverter for starting/running of synchronous machine for different types of machines (Pumped storage, hydro, gas, thermal and nuclear) of various ratings. Out of the supplies made, at least 2 (two) sets of min. 15MW rating SFC/LCI should have successfully started / operated Synchronous machine for a period of 2 (two) years or more as on the application closing date of this EoI.

(OEM is required to substantiate the above PQRs by providing suitable document as documentary proof)

Relevant documentary evidence like Purchase Order (PO) and documentary evidence of PO executed by OEM, Performance Certificate from the End-user, self-certified supply reference list etc. to substantiate the fulfilment of above requirements shall be furnished along with application.

3.7 RESTRICTIONS ON SPECIFIED TIE-UP WITH AN ENTITY FROM A COUNTRY WHICH SHARES A LAND BORDER WITH INDIA:

OEM(s) from a country which shares a land border with India means:
a) An entity incorporated, established or registered in such country; or
b) A subsidiary of an entity incorporated, established or registered in such country; or
c) An entity substantially controlled through entities incorporated, established or registered in such country; or
d) An entity whose beneficial owner is situated in such a country; or
e) An Indian (or other) agent of such an entity; or
f) A natural person who is a citizen of such a country; or
g) A consortium or joint venture where any member of the consortium or joint venture falls under any of the above.

Note: The GoI order (Public Procurement No. 4), issued on 23.02.2023 under F.7/10/2021-PPD(1), amends Rule 144(xi) of GFRs 2017 to also restrict public procurement from bidders with specified Transfer of Technology (ToT) arrangements with entities from countries sharing a land border with India.

3.8 INSTRUCTIONS:

3.8.1 The interested OEM shall ensure that their duly filled and complete response along with following annexures are received by BHEL on or before the last date of EOI.

Annexure-1: Details required from OEM
Annexure-2: OEM's experience in the field of Static Frequency Converter (SFC) / Load Commutated Inverter (LCI)
Annexure-3: Information on various technical features of Static Frequency Converter (SFC) / Load Commutated Inverter (LCI)
Annexure-4: Evaluation Criteria
Annexure-5: General details of the OEM

The response shall necessarily be accompanied with following details as applicable:

1. Company Background
2. Technical features/ product catalogue
3. Details of current manufacturing facilities and relevant certificates
4. Reference list of Customers
5. Audited Annual Accounts along with Statutory Auditor’s report for last 3 (three) years

3.8.2 Language: All correspondences and documents related to the EoI response shall be in English language, provided that any printed literature furnished by the OEM 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 application, the English translation shall govern.

3.8.3 The OEM shall abide by the terms & conditions, as applicable, of the EoI.

3.8.4 All pages of the response against this EoI shall be duly signed by the authorized signatory.

3.8.5 Multiple proposals from the same OEM should not be submitted.

3.8.6 BHEL/nominated TPIA (Third-Party Inspection Agency) may at its discretion shall inspect the OEM's works / office / reference site premises for the purpose of evaluation, as deemed necessary before selection of Partner. BHEL's decision in this regard shall be final.

3.8.7 OEMs who have been debarred or blacklisted by the Government of India, any State Government, or any Public Sector Undertaking (PSU) or entity owned or controlled by them, and whose debarment/blacklisting is in force as on the date of submission of the EoI, shall not be eligible for participation.

3.8.8 BHEL shall receive application 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 application.

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

3.9 PARTNERSHIP MODEL

The scope of cooperation detailed in Clause 3.5 defines the overarching framework of the proposed partnership. The partnership model shall be discussed in detail with OEM who meet the Pre-Qualification Requirements (PQR). The model proposed during discussions will be taken forward for evaluation as per the criteria specified in Annexure-4 of this EoI document.

3.10 EVALUATION CRITERIA

OEM meeting the PQR shall be evaluated in accordance with Annexure-4 of this EoI document. The Top scoring OEM in the evaluation criteria given in Annexure-4 will be considered by BHEL for further discussions/negotiations toward a strategic tie-up/BSA. The final selection of the partner shall be made solely at BHEL's discretion, based on its strategic interests, and the decision shall be final and binding.

3.11 CONFIDENTIALITY:

Information relating to the examination, clarification, evaluation and comparison of EoI and recommendations shall not be disclosed to OEM. Any effort by OEM to influence BHEL in processing of EoI or selection decisions may result in the rejection of the response against EoI.

3.12 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

Details required from OEM

Sl. No.	Requirement	OEM's response (YES / NO)	Remarks
1.	Whether the OEM has been in the business of supplying SFC/LCI systems for more than 10 years		
2.	Whether the OEM has capability of engineering and product development of 12-pulse LCI feeding 12-pulse Synchronous Motor.		
3.	Whether the Company background and its product profile/ catalogues along with technical details of SFC/LCI, which is being offered to BHEL under this EoI, enclosed.		
4.	Whether OEM's detailed reference list for SFC/LCI (including performance certificates, satisfactory operation certificates etc.) have been enclosed. In case, the OEM has any supplies in India, please specify exclusively in the above list.		
5.	Whether OEM's annual audited financial reports including auditor's report for last 3 years have been enclosed		
6.	Whether the OEM owns the Intellectual Property Rights for the technology support to be provided under the Strategic Tie-up / Business Sharing Agreement (BSA). If yes, whether list of such Intellectual Property Rights enclosed.		
7.	Whether the OEM has any experience in establishing new manufacturing, testing and assembly facilities. If so, please specify.		
8.	Whether OEM has any technology tie-up/ Strategic Tie-up/ business collaboration with any other entity in the world for SFC / LCI. If so, please specify.		
9.	Whether the OEM has annual manufacturing facility of supplying approx. 50MW of SFC/LCI.		
10.	Whether the SFC/LCI System being proposed for business sharing/ strategic tie-up to BHEL is approved for all necessary certifications (to be substantiated with necessary certificates)		

11.	Whether the Original Equipment Manufacturer (OEM) is manufacturer of Thyristor Stacks & Electronic modules. In case OEM does not manufacture Thyristor Stacks and Electronic modules in-house, details (such as make, model, rating etc.) of vendor manufacturing these items to be furnished		
12.	Details about the total Strength of Engineering/ Technical/ R&D Personnel in Power Electronics		
13.	Whether the OEM has any presence in India. If so, please specify.		
14.	Whether the OEM has secured commercial order for supply of SFC/LCI through competitive bidding process in last 3 years.		
15.	Whether the OEM is from a country which shares a land border with India. If yes, OEM will be eligible to respond to this EoI only if OEM is registered with Competent Authority (Registration Committee constituted by the Department for Promotion of Industry and Internal Trade (DPIIT) of Govt. of India). The validity of such registration may be specified and registration certificate shall be submitted. Such registration should be at least valid for the entire period of EoI due date or any extension thereof. (Refer clause:3.7 under section-3 for more details.)		
16.	Details of the Shareholding pattern of the OEM. Relevant document certified by competent authority to be submitted.		

(Signature with seal)
(Authorised Signatory of the OEM)

Annexure-2

OEM'S EXPERIENCE IN THE FIELD OF STATIC FREQUENCY CONVERTER (SFC) / LOAD COMMUTATED INVERTER (LCI)

Sl. No.	Requirements	OEM's response (YES/NO) and remarks if any
1.	Whether the bidder is an Original Equipment Manufacturer (OEM) of Static Frequency Converter (SFC) / Load Commutated Inverter (LCI) owning the IPRs.	
2.	The OEM shall have an experience of minimum 10 years in the design, engineer, manufacture and installation Static Frequency Converter (SFC) / Load Commutated Inverter (LCI). Whether OEM meets above PQR and suitable documentary evidence to substantiate the fulfilment of this PQR has been submitted.	
3.	Number of Static Frequency Converter (SFC) / Load Commutated Inverter (LCI) supplied till date by the OEM: (Please attach reference list)	
4.	Number of Static Frequency Converter (SFC) / Load Commutated Inverter (LCI) supplied by the OEM in last 3 years: (please attach list)	
5.	If more than one family of hardware is being used for Static Frequency Converter (SFC) / Load Commutated Inverter (LCI) for different ratings, OEM to provide relevant information	
5.a	How many types of electronic hardware platform are being used concurrently?	
5.b	Whether all the above hardware platforms will be covered in the Strategic tie-up/BSA to enable BHEL to meet all types of market requirements optimally	
6.	Number of R & D and design engineers working exclusively on Static Frequency Converter (SFC) / Load Commutated Inverter (LCI)	
7.	Year of introduction of the proposed Static Frequency Converter (SFC) / Load Commutated Inverter (LCI) in market	
8.	Number of sets of Static Frequency Converter (SFC) / Load Commutated Inverter (LCI) supplied with this version/ model proposed for business sharing agreement:	

Sl. No.	Requirements	OEM's response (YES/NO) and remarks if any
	a) Supplied: b) Commissioned:	
9.	The highest rating of the machine for which the OEM has supplied Static Frequency Converter (SFC) / Load Commutated Inverter (LCI) may please be furnished:	Indicate response against sl. no. 9.a-9.d below
9.a	Synchronous machine for Pumped storage plants	
9.b	Synchronous machine for Hydro power plants	
9.c	Synchronous machine for Synchronous Condenser applications	
9.d	Synchronous machine for other Industries viz. Thermal power plants, etc.	
10.	Maximum rating of Static Frequency Converter (SFC) / Load Commutated Inverter (LCI) supplied till date	
11.	Whether interface with both AC and DC excitation system possible for the Load Commutated Inverter (LCI) / Static Frequency Converter (SFC)	
12.	Whether OEM possess the capability to design, engineer, and supply LCI systems for Renovation & Modernization (R&M) applications. The LCI shall be compatible with existing BHEL make motor input voltage levels of 1.2 kV, 2.3 kV, and 4.1 kV, with minimal modifications to the motor and associated electrical systems. Note: The excitation system employs anti-parallel connected SCRs for bidirectional AC control in the 3-phase excitation circuit, operating on a principle analogous to a TRIAC arrangement.	
13.	Whether the OEM owns IPR for the thyristor bridges of continuous rating.	
14.	OEM shall provide details of planned product upgrades, new versions, and technology enhancements of the SFC/LCI system over the next 2–5 years. OEM shall also confirm that such upgrades shall be made available to BHEL, including necessary technical support, documentation, under the strategic tie-up arrangement.	
15.	The OEM shall have designed, engineered, manufactured, erected and commissioned (E&C could be directly or through associates) Static Frequency Converter (SFC) / Load Commutated Inverter	

Sl. No.	Requirements	OEM's response (YES/NO) and remarks if any
	(LCI), with any hardware platform for different types of applications (pumped storage, hydro, gas, SYNCON, thermal, etc.) for various ratings of synchronous machines. Out of the supplies made, at least 2 (two) sets of min. 15MW rating SFC/LCI should have successfully started / operated Synchronous machine for a period of 2 (two) years or more as on the application closing date of this EoI. If OEM meets above PQR, suitable documentary evidence to substantiate the fulfilment of this PQR to be submitted.	
16.	OEM shall have a defined Obsolescence Management Plan covering all critical components of the SFC/LCI system. OEM shall: – Notify BHEL of any impending obsolescence at least 2 years in advance; – Provide Last-Time-Buy (LTB) options with adequate notice; – Identify, qualify, and support form-fit-function compatible alternate components/sources; – Support necessary redesign/retrofit/upgrade solutions, ensuring compatibility with existing systems; – Ensure availability of spares, technical support, and service support for a minimum period of 10 years from supply.	

Signature & Seal:
(Authorised Signatory of the OEM)

Annexure-3

INFORMATION ON VARIOUS TECHNICAL FEATURES OF STATIC FREQUENCY CONVERTER (SFC)

Sl. No.	Feature	Response Yes / No / Remarks
1.	The Static Frequency Converter (SFC) / Load Commutated Inverter (LCI) platform offered for business sharing shall be the latest generation being marketed by the OEM	
2.	The same family of hardware shall be suitable for the entire range of Static Frequency Converter (SFC) / Load Commutated Inverter (LCI). In case multiple applicable hardware items are involved, all such hardware shall be covered under the Strategic Tie-up/Business Support Agreement (BSA).	
3.	The microprocessor/microcontroller/DSP/FPGA used in the main controller shall be of reputed/proven make	
4.	The Static Frequency Converter (SFC) / Load Commutated Inverter (LCI) platform being proposed for Strategic tie-up/BSA shall have qualified for type test for environmental conditions, mechanical stability, harmonics requirements as per IEEE-519 and EMI/EMC immunity. (List of all type test conducted successfully on the proposed Static Frequency Converter (SFC) / Load Commutated Inverter (LCI) to be submitted during the application submission)	
5.	The Static Frequency Converter (SFC) / Load Commutated Inverter (LCI) being proposed shall use standard AC/DC auxiliary power supplies. Ratings for the power supplies to be mentioned.	
6.	The Static Frequency Converter (SFC) / Load Commutated Inverter (LCI) being proposed shall be suitable for operation up to an ambient temperature of 50°C and relative humidity of 95% non-condensing.	
7.	The regulation function in the Static Frequency Converter (SFC) / Load Commutated Inverter (LCI) shall have the following features but not limited to the same :	
7a.	Soft start features during initial voltage build-up	
7b.	Catch-on-fly	
7c.	Momentary power loss ride through	
7d.	Thyristor healthiness check	
7e.	Gate pulse generation and amplification	
7f.	Pulse supervision for all pulses	
8.	Whether detailed specification of following major equipment's shall be provided for localizing the vendor base in India: a) Reactor	

	b) Filters / chokes c) Water Cooling arrangements, etc.	
9.	Bidder shall provide detailed technical design parameters, impedance (%) requirements, duty cycle, sizing calculations, etc. required for manufacturing Transformer.	
10.	The Power converters shall be air cooled (natural or forced) or water cooled in order to meet the starting/running requirements of the synchronous machine.	OEM to Indicate the ranges for air-forced and water-cooled Drive
11.	All equipment's, components and subassemblies used in Static Frequency Converter (SFC) / Load Commutated Inverter (LCI) shall be covered under Strategic tie-up/BSA	
12.	Testing requirements at factory and at Site for the complete Static Frequency Converter (SFC) / Load Commutated Inverter (LCI) system shall be covered under Strategic tie-up/BSA	
13.	The system shall have interface for connectivity with higher order control system / third party DCS system	
14.	The Static Frequency Converter (SFC) / Load Commutated Inverter (LCI) shall have suitable local and remote terminal for operation with GUI/HMI based software for parameter setting, commissioning, troubleshooting (trending & event recording) and upload/downloading the software. A GUI/HMI PC based Engineering tool shall be available for configuring project specific software. The system shall be capable of interfacing with third party devices under various open Standard Communication Protocols viz. MODBUS/ Profibus.	
15.	The Static Frequency Converter (SFC) / Load Commutated Inverter (LCI) shall have feature of capturing fast trends i.e., Feature for capturing of Pre-& Post-disturbance recording integral to the SFC/LCI proposed under Strategic tie-up/BSA.	
16.	Load Commutated Inverter (LCI) shall be integrated with BHEL supplied Motor (existing voltage ratings are 1.2 kV/2.3 kV/4.1 kV). Existing gate firing interface is not optical fibre based but are electrically fired. Confirmation for integration shall be covered under Strategic tie-up/BSA.	
17.	Whether remote diagnostics facility is available for Static Frequency Converter (SFC)/ Load Commutated Inverter (LCI). If Yes, it shall be covered under Strategic tie-up/BSA.	
18.	In addition to the above, the following features are asked for in Indian Market as part of Static Frequency Converter (SFC) / Load Commutated Inverter (LCI) regularly. The OEM to confirm the availability of these features in the system being proposed for Strategic tie-up/BSA. In case these features are not readily available in the system being proposed for Strategic tie-up/BSA, the OEM shall agree to undertake development/ joint development along with BHEL to meet these local requirements like:	

	i. Auto tuning of Machine parameters ii. Storage of Machine parameters iii. Connectivity through IEC 61850 protocol	
19.	Max. rating of SFC (without parallel configuration) available in portfolio for starting operation - Forced Air Cooled - Water Cooled	
20.	Max. rating of LCI (without parallel configuration) available in portfolio for continuous operation - Forced Air Cooled - Water Cooled	
21.	Output voltage ratings of SFC and LCI (without output Transformer)	
22.	Whether Heat exchanger in case of water cooled SFC/LCI can be modified for meeting the Indian conditions of water and its parameters.	
23.	Whether redundancy in cooling fans is available in case of forced air cooled SFC/LCI	
24.	Whether redundancy in cooling pumps & heat exchanger is available in case of water cooled SFC/LCI	
25.	Whether Conformal coating (3C2, ISA-G3/GX, etc.) is available for control cards	
26.	Whether harmonics requirements as per IEEE-519 are being met in case of LCI	
27.	Whether OEM shall have to make any changes in LCI so that it can be used to run an existing motor	
28.	Whether 4-quadrant operation of SFC/LCI is possible	
29.	Whether following modes are available: • Variable torque • Constant torque • Constant power	
30.	Short time overload requirements for LCI (110% - 115% of rated current for 1 minute)	
31.	Is drive suitable for Motor speed range from 10% to 105% of rated speed.	
32.	Whether LOTO provision / manual interlocks are available as safety provisions	
33.	Whether Fault diagnostic facility is available for SFC/LCI	
34.	Whether AC excitation system control is part of LCI panel or separately mounted	
35.	List of external power supplies required for SFC/LCI to be indicated	
36.	Whether offered drive is compliant with cyber security norms	

Signature & Seal:
(Authorised Signatory of the OEM)

Annexure-4

EVALUATION CRITERIA

Sl. No.	Criteria	Scale / Scheme of marking	Max. Marks	Supporting documents to be submitted by OEM
1	**Organizational Soundness**		**06**	
1.1	Year of incorporation	≥ 10 years: 2 < 10 years : 1	2	Memorandum of association / company annual report / other relevant supporting documents
1.2	Plant annual capacity of manufacturing SFC/LCI (in MW)	≥ 50 MW: 2 ≥ 10 to < 50 MW: 1 <10 MW : 0	2	
1.3	Number of core R&D employees with more than 10 years of experience in Power Electronics	≥ 15: 2 ≥ 10 to < 15: 1 < 10 : 0	2	
2	**Technical competence**		**08**	
2.1	IP & Licensing (Number of patents)	> 10: 6 ≥ 5 to ≤ 10: 4 ≥ 1 to < 5 : 2	6	List of patents
2.2	Efficiency of SFC / LCI system (including auxiliaries)	≥ 95%: 2 ≥ 93% to < 95%: 1 <93%: 0	2	Test certificate / test report / other relevant document
3	**Experience**		**14**	
3.1	No. of projects where SFC/LCI system were supplied	≥ 5 nos.: 2 ≥ 1 - < 5 nos.: 1	2	List of projects executed
3.2	Highest rating of SFC/LCI manufactured/got manufactured and supplied (in MW)	≥ 25: 4 ≥ 15 – <25: 3 ≥ 10 – <15: 2 ≥ 5 – <10: 1 < 5 : 0	4	PO / LOI/ Test certificate / test report / other relevant document
3.3	Number of years of successful operation of supplied SFC/LCI	≥ 2 years: 3 ≥ 1 - < 2 years: 2 <1 year : 0	3	Customer certificate / other relevant document
3.4	Whether LCI can meet the voltage rating of 1.2KV, 2.3KV & 4.1KV for existing motors for R&M projects.	Yes: 5 No : 0	5	Valid schematic drawings, etc.
4	**Commercial and financial information**		**08**	
4.1	Average annual turnover for the last 3 years	≥ 1500 Million INR: 5 1000 – <1500 Million INR: 4 750 – <1000 Million INR: 3	5	Audited financial reports

		500 – <750 Million INR: 2 100 – <500 Million INR: 1 (Currency conversion rates to be considered : As per State Bank of India Repo rate as on final date of submission of EOI)		
4.2	Net worth	Positive net worth in last 3 years: 3; otherwise : 0	3	Audited financial reports
5	**After sales support**		**05**	
5.1	Number of projects where Annual Maintenance Contract (AMC) has been awarded	1 mark for each project limited to max. 5 projects	05	PO / LOI copy / other relevant document
6	**Strategic fit of partnership model**		**53**	**Confirmation by OEM**
6.1	*Offering necessary support to supply in Semi Knocked Down (SKD) condition in the form of factory-assembled and tested modules/sub-assemblies, including but not limited to: – Fully populated and tested PCBs / control electronic modules**;** – Pre-assembled and factory-tested thyristor stack assemblies complete with heat sinks, clamping arrangements (including pressure hardware), and module housings/enclosures; – Pre-programmed controller modules/cards with loaded firmware/software, along with associated interface and auxiliary modules – Assembled DC reactor units; – Pre-wired and factory-tested panels/ cubicles**;** – Finished enclosures; – Cooling systems (fans/blowers) mounted in position; and – Ready-made wiring harnesses with connectors/terminations.	Yes: 6 No : 0	6	Yes/No
6.2	**Offering necessary support to supply in Completely Knocked Down (CKD) condition at component/module level**,** including but not limited to: – Power semiconductor devices; – Bare/unpopulated PCBs/ electronic modules; – Controller cards/modules along with firmware/software loading and configuration tools, installation packages, licenses/access credentials (where applicable), and associated	Yes: 10 No : 0	10	Yes/No

	documentation; – HMI unit – Individual DC reactors supplied as loose coils/core assemblies; – Machined but unassembled enclosures; – Separate cooling fans/blowers; – Wiring materials or partially prepared harnesses (not fully terminated); – Machined heat sinks supplied loose; – Thyristor module housings (unassembled); and – Busbars (copper conductors).			
6.3	OEM shall furnish the list of major components/ sub-assemblies of the SFC/LCI system, including but not limited to reactors, integrated AC excitation system (for LCI), power semiconductor devices, control electronic modules/PCBs, cooling systems (fans/blowers), thyristor stack components (including heat sinks and clamping hardware), busbars, and enclosures/panels, along with the names of respective sub-vendors/manufacturers. OEM shall also provide necessary authorization/consent to BHEL for sourcing such components directly from the identified manufacturers, wherever required.	Yes: 4 No : 0	4	Yes/No
6.4	OEM shall provide necessary technical support, training, and on-site supervision during the initial assembly and integration of SFC/LCI systems at BHEL-EDN works. Such support shall include: – Guidance on mechanical assembly, electrical interconnection, and system integration; – Supervision of critical activities, including thyristor stack assembly, clamping, and alignment; – Assistance in troubleshooting and commissioning.	Yes: 5 No : 0	5	Yes/No
6.5	OEM shall provide necessary support for establishment of testing facilities at BHEL-EDN works, including but not limited to: – Detailed test procedures, protocols, and acceptance criteria; – Identification and specification of required tools, fixtures, jigs, and test equipment (including proprietary and third-party	Yes: 5 No : 0	5	Yes/No

	equipment); – Support for procurement/ selection, installation, and commissioning of test equipment; – Assistance in validation and calibration of the testing setup. The OEM shall also provide expert support, including deputation of qualified personnel as required, for conducting type tests and routine tests at BHEL-EDN works and/or at accredited third-party laboratories in India, wherever applicable for specific type tests.			
6.6	OEM shall provide structured training to BHEL-EDN personnel at OEM works and/or BHEL-EDN works, as mutually agreed during EOI finalisation. The training shall cover, but not be limited to: – Design, operation, and maintenance of SFC/LCI systems; – Assembly and integration procedures (including thyristor stack assembly and clamping); – Testing and commissioning practices; – Troubleshooting and diagnostics.	Yes: 5 No : 0	5	Yes/No
6.7	OEM shall grant exclusivity to BHEL for the Indian market for supply/ marketing of SFC/LCI systems under the proposed strategic tie-up, for a mutually agreed scope and period.	Yes: 6 No : 0	6	Yes/No
6.8	Strategic alignment of the partnership model	To be assessed based on finalised partnership model	12	OEM shall propose a detailed partnership model for strategic alignment with BHEL, to be finalized through mutual discussions.
7	Duration of support to BHEL		**06**	
7.1	OEM shall provide after-sales service, spares support, and obsolescence management support for a minimum period of 10 years from supply**,** including availability of critical spares, technical support, and upgrade/ retrofit solutions.	Up to 10 years from supply: 06 Up to 08 years from supply: 04 Up to 05 years from supply: 02	06	Yes/No

Note: *Semi Knocked Down (SKD) phase: OEM shall provide complete technical information, drawings, specifications, installation procedures, interconnection details, testing procedures, and documentation

required to enable installation, interconnection, integration, testing, commissioning, operation, and maintenance at BHEL-EDN works for all supplied modules/sub-assemblies, including electronic PCBs/modules, thyristor stack assemblies, and other associated systems of the SFC/LCI.

i.e, under SKD/semi-assembled condition, the modules are supplied with internal assembly, wiring, and functional checks already completed at manufacturer works, requiring at BHEL-EDN works only:

- Mechanical placement/erection of modules in designated panels or locations
- Interconnection of power circuits (bus bars/cables)
- Interconnection of control wiring between modules
- Final integration, system-level testing, and commissioning

**Completely Knocked Down (CKD) phase: OEM shall provide complete technical information, drawings, specifications, bill of materials (BOM), manufacturing details, assembly procedures, inspection and testing procedures, acceptance criteria, and documentation required to enable component/module level manufacturing (where applicable), PCB population, mechanical assembly, electrical interconnection, integration, and testing at BHEL-EDN works for all electronic PCBs, thyristor power modules, and other associated items used in the SFC/LCI system.

i.e, under CKD condition, where the system is supplied at component /module level, BHEL-EDN's scope shall include complete manufacturing, assembly, mounting, interconnection, wiring, ELECTRONIC MODULES population, integration, and full system testing/commissioning of the SFC/LCI system. The activities broadly cover:

- Mechanical Assembly
- Thyristor Stack Build
- Printed Circuit Board Assembly (Electronic Modules) & Control Electronics Integration
- Controller firmware/software loading, configuration, parameterization, diagnostics, and functional validation using OEM-provided tools/software
- Busbar & Power Circuit Assembly
- Electrical Wiring & Interconnection
- Integration of subsystems viz. power stacks, control panels, cooling systems, reactors
- Module-level Testing viz. thyristor power modules, electronic modules, controller modules, etc. Inspection (functional & type-tests) and commissioning.

Annexure-5

General Details of the OEM

Legal name of company	
Country of Constitution	
Year of constitution	
Legal address in country of constitution	
Mobile number of the authorised person	
Email-ID of the authorised person	

Attested/Notarised copy of original documents of following to be furnished:

- Articles of Incorporation or relevant documents of Constitution, and documents of Registration of the legal entity named above.

(Signature of authorized signatory)

Name: _____

Designation: _____

Address: _____

Date: _____