Ref: TBMS/2024-25/EOI/Khavda-Olpad VSC HVDC/VSN/1
Date: 05.07.2024

EXPRESSION OF INTEREST (EOI)

Bharat Heavy Electricals Limited (BHEL), a leading Indian Engineering and Manufacturing Enterprise engaged in Engineering, Manufacturing of products and execution of turnkey projects in the field of Power Generation and Transmission

invites

Expression of Interest (EOI) for formation of Appropriate Business Association to jointly address forthcoming VSC (Voltage Source Converter) HVDC Project Turnkey Business Opportunity in India

" ±500kV, 2500MW Khavda – Olpad VSC Based HVDC "

for further details please visit: www.bhel.com

Schedule of EOI:

Start date:	05.07.2024
End Date:	04.08.2024 (upto 03.00 pm IST)

DISCLAIMER

All information contained in this EOI provided / clarified are in good interest and faith. The information contained in this Expression of Interest document or subsequently provided to Applicant(s), whether verbally or in documentary or any other form, by or on behalf of BHEL, is provided on the terms and conditions set out in this EOI and such other terms and conditions subject to which such information is provided.

The purpose of this EOI is to provide interested parties with information that may be useful to them in the formulation of their application for qualification and subsequent selection pursuant to this EOI. This EOI is not an offer by BHEL to the prospective Applicant(s) or any other person. This EOI is neither intended nor shall it be construed as creating or requiring any on-going or continuing relationship or commitment with any party or person.

Though adequate care has been taken in the preparation of this EOI document, the interested firms shall satisfy itself that the document is complete in all respects. The information is not intended to be exhaustive. Interested Agencies are required to make their own enquiries and assumptions wherever required. Intimation of discrepancy, if any, should be given to the specified office immediately. If no intimation is received by this office by the date mentioned in the document, it shall be deemed that the EOI document is complete in all respects and firms submitting their interest are satisfied with the EOI Document in all respects.

BHEL also reserves the right to withhold or withdraw the process at any stage. Neither BHEL nor its employees and associates will have any liability any loss, expense or damage which may arise from or be incurred or suffered in connection with anything contained in this EOI document or any matter deemed to form part of this EOI document, the information and any other information supplied by or on behalf of BHEL. BHEL accepts no liability of any nature whether resulting from negligence or otherwise howsoever caused arising from reliance/use of any statements/information contained in this EOI by the Applicant. BHEL is not making any representation or warranty, express or implied, as to the accuracy or completeness of any information/statements made in this EOI.

The Applicant shall bear all its costs associated with or relating to the preparation and submission of its Application including but not limited to preparation, copying, postage, delivery fees, expenses associated with any demonstrations or presentations which may be required by BHEL or any other costs incurred in connection with or relating to its Application. All such costs and expenses will remain with the Applicant and BHEL shall not be liable in any manner whatsoever for the same or for any other costs or other expenses incurred by an Applicant in preparation or submission of the Application, regardless of the conduct or outcome of the EOI.

Invitation for Expression Of Interest (EOI) for formation of Appropriate Business Association (Project specific JV Consortium/Associate/Any other route) to jointly address following forthcoming VSC (Voltage Source Converter) HVDC Project Turnkey Business Opportunity in India:

a. **±500kV, 2500MW Khavda – Olpad VSC Based HVDC (through TBCB route).**

This Expression of Interest (EoI) seeks response from Qualified OEMs, who are willing to be associated with BHEL through a Business sharing or any other collaboration agreement basis, to execute project as stated above.

About Bharat Heavy Electricals Limited (BHEL)

Bharat Heavy Electricals Limited (BHEL) is a Central Public Sector Enterprise, wherein Government of India is holding 63.17% of its equity. It is an integrated power plant equipment manufacturer and one of the largest engineering and manufacturing companies of its kind in India having a turnover of about USD 3 billion. The company is engaged in the design, engineering, manufacture, construction, testing, commissioning and servicing of a wide range of products and services for the core sectors of the economy, viz. Power, Transmission, Industry, Transportation, Renewable Energy, Oil & Gas and Defence with over 180 product offerings to meet the needs of these sectors. Since its inception in 1964, BHEL has been the solid bedrock of evolution of India's Heavy Electrical Equipment industry.

BHEL has 16 manufacturing units, 4 power sector regions, 8 service centers and 15 regional offices besides a host of project sites spread all over India and abroad. Revenue of BHEL for the year 2022-23 was around USD $2.65 Billion (Rs 22,136 Cr). Highly skilled and committed manpower of approx. 29500 Employees, state-of-art manufacturing facilities and technologies have helped BHEL to deliver a consistent track record of performance. With the current order book exceeding US $ 13 Billion (Rs. 108600 Cr), BHEL is poised for an excellent future growth.

With key focus on project execution, the worldwide installed base of power generating equipment supplied by BHEL has exceeded 178 GW. BHEL's equipment that account for about 60% of the country's total generation from thermal utility sets (coal based), stand a testimony to its valuable contribution towards nation building. BHEL's global competitiveness has established its footprint in all the inhabited continents with references in 82 countries.

The high level of quality & reliability of BHEL products is a testimony to its adherence to international standards by acquiring and adapting some of the best technologies from leading companies in the world including General Electric, Siemens AG, Mitsubishi Heavy Industries Ltd. etc., together with technologies developed in its own R&D centres. BHEL invests more than 2.5% of turnover on R&D and innovation.

More details about the entire range of BHEL's products and operations can be had by visiting our web site www.bhel.com.

About Transmission Business Group

Transmission Business Group (TBG) of BHEL is a well-established player in the field of Power Transmission with some major products and systems in its range of manufacture and supply. The Group undertakes projects on turnkey basis covering the complete Engineering, Procurement, Supply, Construction, Commissioning and after sales service for AC switchyards/substations up to 765kV, GIS switchyards/substations up to 765kV, HVDC Converter Stations, Reactive Power Compensation Schemes. The Group has capability to conduct System studies as required for above business.

BHEL: In HVDC

BHEL pioneered HVDC in India with the commissioning of NHVDC project in 1993 indigenously. BHEL has already installed/commissioned many HVDC projects in India on EPC basis jointly with HVDC OEM as listed below:

- 1500MW, ± 500kV Rihand- Delhi HVDC project.
- 1500MW, ± 500kV Chandrapur-Padghe HVDC project.
- 2500MW, ± 500kV Balia - Bhiwadi HVDC Project
- 6000MW, ±800kV North-East to Agra Multiterminal HVDC Project (Worlds Largest).
- 6000MW, ±800kV Raigarh – Pugalur HVDC Project

For the above projects, BHEL has supplied from its state-of-art in-house Manufacturing & Testing facilities, its own make major HVDC products like Converter Transformers, Thyristor Valves, Non FST panels, Capacitor Banks, Reactors, Instrument Transformers, SCADA, DC & AC Line Insulators, MV Switchgear, etc. Further, we also have rich experience in Construction, Erection, Testing, and commissioning and site management for various EHV and HVDC projects.

Background of EOI

- Government of India has set a target to establish 500GW of renewable energy (Solar, Wind, Other RE mode) capacity by 2030.
- To evacuate this power from Generation centres (Rajasthan, Gujarat, Leh, Madhya Pradesh, other parts of India) to the various Load centres, multiple transmission assets (AIS and GIS based Switchyard/Substations, Transmission Lines, HVDC Terminal stations, FACTS, etc) are already under execution/Tendering stage and many such assets are planned for implementation in stage- wise manner over the next 5 years and beyond.
- Above transmission schemes are getting implemented at state level (Intrastate Scheme) as well as at the central level (Interstate) by POWERGRID (RTM Mode) or through Private Transmission Developers (TBCB Mode).
- With the above in background, to evacuate power from the RE parks getting established in the Khavda Region of Gujarat, following VSC technology based HVDC transmission scheme is expected in the very near timeline

Transmission Scheme	Transmission System for Evacuation of Power from potential renewable energy zone in Khavda area of Gujarat under Phase-V (8 GW): Part C
VSC HVDC Requirement	o Establishment of 2500 MW, ± 500 kV KPS3 (HVDC) [VSC] terminal station (2x1250 MW) at a suitable location near KPS3 substation with associated interconnections with 400 kV HVAC Switchyard. o Establishment of 2500 MW, ± 500 kV South Olpad (HVDC) [VSC] terminal station (2x1250 MW) along with associated interconnections with 400 kV HVAC Switchyard of South Olpad S/s

- As part of the above scheme, 2 Nos. VSC HVDC technology based Terminal stations will be established in Khavda (Gujarat) and Olpad (Gujarat). Both the stations will be located 650 km (approx.) apart)
- Above scheme/Project is approved (in TBCB mode) in the 14th National Committee on Transmission (NCT) of Central Electricity Authority (CEA) on 07-07-2023 and subsequently cleared by the Ministry of Power vide gazette notification dated 04-09-2023.
- Bid Process Coordinator: PFC Consulting Limited (PFCCL)

In line with GOI's Public Procurement (Preference to Make in India) policy already in place, there is the requirement of minimum quantum of indigenous supplies from India for the major equipment like Interconnecting Transformers, IGBT Valves, Controls, etc. for the VSC HVDC project.

Considering above, on the basis of BHEL's manufacturing capabilities and vast EPC experience in the HVDC domain, BHEL intends to have suitable association (Project specific JV Consortium/Associate/Any other route) with a leading company having requisite experience in VSC HVDC technology, thereby generating synergy through

domestic manufacturing and sourcing by BHEL for the purpose of increasing the value addition in India. Thus the association will also have increased chances of success in the forthcoming VSC HVDC tender.

Qualification Requirement of VSC HVDC OEM

Technical Criteria*:*

a) *The OEM shall be a regular manufacturer of Voltage Source Converter (VSC) High voltage Direct Current Transmission equipment who has implemented a contract wherein the scope involves engineering, manufacturing, supply, erection, testing and commissioning of at least one long distance VSC based HVDC transmission converter station or a VSC based Back-to Back HVDC system of a unit rating of at least 250MW , along with all associated auxiliary equipment and ancillary works and the VSC HVDC system should have been in Satisfactory Operation for a period of not less than one year as on the originally scheduled date for the dead line for submission of first stage bid*"

OR

b) The OEM shall be a manufacturer of High voltage Direct Current Transmission equipment who has implemented a contract, wherein the scope involves engineering, manufacturing, supply, erection, testing and commissioning of at least one long distance HVDC converter station or a Back-to-Back HVDC system of a unit rating of at least 250 MW, along with associated auxiliary equipment and ancillary works and the HVDC system should have been in Satisfactory Operation for a period of not less than two years as on the originally scheduled date for the dead line for submission of first stage bid as mentioned above.

AND

The OEM has implemented a contract, wherein the scope involves engineering, manufacturing, supply, erection supervision, testing and commissioning of at least one VSC based HVDC transmission project of a unit rating of at least 250 MW, along with associated auxiliary equipment and ancillary works and the HVDC system should have been in Satisfactory Operation as on the originally scheduled date for the dead line for submission of first stage bid as mentioned above.

Financial Criteria: Net Worth for last 3 financial year should be positive.

In case OEM is a holding company, the Financial Position criteria referred to in Financial Criteria above shall be that of holding company only (i.e. excluding its subsidiary / group companies). In case OEM is a subsidiary of a holding company, the Financial Position criteria referred to in Financial Criteria above shall be that of subsidiary company only (i.e. excluding its holding company)

Responses are sought with supporting proofs for meeting the Technical and Financial Criteria and also other details explaining the capability of executing VSC HVDC projects.

Any changes/clarification issued by implementing agency will be intimated through Clarification/Corrigendum to this EOI and will be published on BHEL's website (www.bhel.com)

The EOI Proposal

Interested companies who wish to join hands with BHEL for forming a suitable association (Project specific JV Consortium/Associate/Any other route) to address forthcoming VSC HVDC project business in India may submit their Expression of Interest (EoI), **latest by 3.00 pm on 4th August, 2024.**

Expression of Interest (EoI) should be accompanied by:

- Company details (as per Annexure-1)
- The proposal for association.
- Details/Documents on Company Profile, Certificate of Registration or Incorporation.
- Products and Services offered - Technical features/ Product range

- Reference list of relevant project experience
- Performance Certificates on VSC HVDC projects issued by end user matching requirements as specified under para "Technical Criteria" of this EOI Notice.
- Audited Annual Financial Reports for at least last three years along with their authenticated translations in English including proof of meeting specific conditions as specified under para “Financial Criteria”.
- Filled DOW (Division of scope) as part of EOI

Note: The offers will be evaluated and compared on the merits as below:

- The Technical and Financial Criteria as stated above
- Previous experiences on similar associations in HVDC projects.
- The quantum of scope-sharing proposed in the Broad Division of work.
- Any additional proposal (worth considering) by HVDC OEM

Instruction to Applicants

- The proposal complete in all respect should be marked to:

Directly Marked to (Soft)	Copy Marked to (Soft)	
Parthasarathi Das General Manager – Marketing & Commercial Tel: +91-120-6748138 Mob: 9810401728 e-mail: pdas@bhel.in	Manoj Kumar AGM - Marketing Tel: +91-120-6748137 Mob: 9810523590 e-mail: manoj.kumar@bhel.in	Vishal Shailendra Naidu DGM - Marketing Tel: +91-120-6748505 Mob: 9968992545 e-mail: vsnaidu@bhel.in

- Hardcopy of the EOI proposal to be sent at the following Office address
  DGM-Marketing,
  Transmission Business Group, BHEL, 5th Floor, Sector 16A, Plot-25, Noida-201301 (UP)
- The details submitted by the applicant(s) shall be complete in all respects and BHEL may seek clarifications/additional information as considered necessary.
- Any request for further information or clarification on the EOI document may be submitted to DGM-Marketing within 07 days from date of issue of EOI.
- Responses to EOI are to be submitted in English only. Supporting documents, as required, should also be in English language. In case of some documents being available in languages other than English, the applicant shall necessarily provide duly authenticated translated version of the same in English.
- Notwithstanding anything contained in this EOI, BHEL reserves the right to accept or reject any application and to annul the EOI process in whole or part, at any time without any liability or any obligation for such acceptance, rejection or annulment, and without assigning any reasons thereof.
- 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.
- The EOI process shall be governed by, and construed in accordance with, the laws of India and the Courts at New Delhi shall have exclusive jurisdiction over all disputes arising under, pursuant to and/ or in connection with the EOI process.

Annexure – 1

1. Name of the Company:
2. Legal status of the Company:
3. Brief description of the Company including details of its business groups/subsidiaries/ affiliates:
4. Date of Incorporation
5. Date of Commencement of Business
6. Full address including Email address, Telephone nos. Fax no.
    - Registered Office:
    - Head Office:
    - Address for communication:
    - Contact Details:
    - Email address:
    - Office Address in India, if any:

±500kV, 2500MW, Khavda-Olpad VSC HVDC
Tentative Division of Work

	Doc: Khavda Olpad 25000MW-DOW-BHEL Rev.00		
S.No	**Item Description**	**% share of Total Quantity for each of the listed Items/system proposed by the Prospective HVDC OEM to BHEL for each Converter Terminal**	
		Khavda	**Olpad**
A	**Converter Area**		
1	Interface Transformers		
2	IGBT Valves		
3	Neutral Arrester CT's		
4	Valve Cooling System		
B	**AC Yard Area**		
1	Auto Transformer(400/110/33kV), 200MVA		
2	Shunt Reactor, 80MVar		
3	400kV AC Circuit Breaker		
4	AC Arrester (Line)		
5	AC Isolators, Converter Area		
6	400kV AC Current Transformers		
7	AC CVT's		
8	AC Arrester CT's		
9	Wave Trap's		
10	AC Yard Materials		
11	AC BPI		
12	AC String Insulators and Hardwares		
C	**AC Filter Area**		
1	AC Isolators & free standing E/S		
2	Circuit Breakers		
3	Shunt /Filter Capacitor		
4	Filter Reactor - Upper Coil		
5	Filter Reactor - Lower Coil		
6	Filter Resistors		
7	Filter Arresters		
8	Filter OCT's		
9	Filter CT's		
D	**DC Yard Area**		
1	DC Pole Disconnectors		
2	DC Neutral Disconnectors		
3	DC Pole CT's		
4	DC VT's		
5	DC Arresters		
6	DC Pole Insulators		
7	DC LV Insulators		
8	DC Neutral Capacitors		
9	DC Neutral,Filter,DMR Arrester CT's		
10	DC Filter Equipments - R-L-C		
11	DC Yard materials		
12	DC String Insulators and Hardware		
13	High Speed DC Switch		
14	DC Breaker		
E	**Control & Protection Systems**		
1	Control & Protection - AC		
2	Control & Protection - HVDC for FST		
3	Control & Protection - HVDC for Non FST		
F	**Communication Systems**		
1	Fibre Optic communication		
2	PLC communication		
3	Telephone System		
G	**Auxiliary System - Electrical**		
1	33kV MVS/GIS Switchgear		
2	ACDB/DCDB		

±500kV, 2500MW, Khavda-Olpad VSC HVDC
Tentative Division of Work

	Doc: Khavda Olpad 25000MW-DOW-BHEL Rev.00		
S.No	**Item Description**	**% share of Total Quantity for each of the listed Items/system proposed by the Prospective HVDC OEM to BHEL for each Converter Terminal**	
		Khavda	**Olpad**
3	LT Transformers		
4	Valve Cooling MCC		
5	Illumination		
6	Battery& Battery Chargers		
7	VPS,PAS,CCTV & VCS		
8	BMS & ROXTEC		
H	**Auxiliary System - Mechanical**		
1	AHU		
2	Ventilation system		
3	Fire Fighting system		
4	VESDA system		
5	DG Set		
6	Water Treatment/Supply System		
I	**Civil Work**		
1	Builidng Construction, foundation,trench etc		
2	Steel Structures		
J	**ETC Work**		
1	ETC work		
2	Oil Handling System		
K	**Transportation & Insurances**		
1	Transport of equipments		
L	**Testing Instruments, O&M Equipment**		
1	Testing Instruments		
2	O&M Equipment		
M	**Imported Items**		
1	Imported Items		

Note: Above broad scope matrix is indicative in nature and will be discussed in detail post EOI submission.