



Ref: TBMS/2021-22/EOI/LK_VSC_HVDC/STG-1/1
Date: 23.08.2021

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 Opportunities in India

for further details please visit: www.bhel.com



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 to jointly address following forthcoming VSC (Voltage Source Converter) HVDC Project Turnkey Business Opportunity in India:

- a. **Leh-1, ± 320 kV, 5,000MW with VSC HVDC Terminals at Leh and Kaithal/ any other site as finalised by POWERGRID or Regulatory Bodies.**

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) (www.bhel.com) is a Government of India Undertaking and a Maharatna Company, Established in 1964. BHEL is an integrated power plant equipment manufacturer and one of the largest Engineering and Manufacturing Company of its kind in India. The company is engaged in the Design, Engineering, Manufacturing, Construction, Testing, Commissioning and servicing of a wide range of products and services for core sectors of the economy, viz. Power, Transmission, Industry, Transportation (Railways), Renewable Energy, Oil & Gas, Water and Defense with over 180 products offerings to meet the needs of these sectors. BHEL has been the bedrock of India's Heavy Electrical Equipment industry.

BHEL has a widespread network of 16 Manufacturing Divisions, 2 Repair Units, 4 Regional Offices, 8 Service Centers, 6 Overseas Offices, 3 Joint Ventures, 15 Regional Marketing Centers and current project execution at more than 150 project sites across India and abroad corroborates the humungous scale and size of its operations. BHEL has commissioned 65+ EPC jobs (worth \$14 Billion) for Government/Public Sector Enterprises and private sector companies.

Adding to its achievements, BHEL has joined the elite club of select global giants having an installed base of over 170 GW of power generating equipment globally. BHEL also has a widespread overseas footprint in 78 countries with cumulative overseas installed capacity of BHEL manufactured power plants nearing 10,000 MW.

BHEL has technology tie-ups with leading companies in the world including General Electric Company, Alstom SA, Siemens AG and Mitsubishi Heavy Industries Ltd., supported by technology developments in its own R&D Centers. The quality & reliability of BHEL products at par with other Global players and adheres to international standards.

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 400kV, HVDC Converter Stations, Reactive Power Compensation Schemes. The Group has capability to conduct System studies as required for above business.

[*Note: Currency conversion rate considered: 1 US \$=Rs 74.3 as on 21st August, 2021]



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. For these 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.

Major HVDC projects executed by BHEL jointly with OEMs are:

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

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 175 GW Renewable generation capacity by 2022 which includes 100 GW from Solar and 60 GW from wind. In addition, it is proposed to set up solar power parks of 10000 MW rating in Leh.
- The Transmission evacuation scheme from Leh Solar Park has been planned through VSC based HVDC system.
- Based on the information gathered, in most likelihood, due to the technical challenges involved, POWERGRID-India will develop the Transmission asset for the phase-1 (5000MW) (VSC HVDC terminal stations, Transmission lines, other transmission infrastructure) on Nominated/Regulated Tariff Mechanism (RTM) mode
- Tentative VSC HVDC project details are placed below:
Pkg-1- Leh-1: ± 320 kV, 5,000MW

It is understood that in the most likely scenario, in line with GOI's Public Procurement (Preference to Make in India) policy already in place, POWERGRID is most likely to stipulate a 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, and on the basis of BHEL's manufacturing capabilities and vast EPC experience in the HVDC domain, BHEL intends to have association (on EPC basis) with a leading company having requisite experience in VSC HVDC projects, 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.

Such a company having experience in execution of VSC HVDC projects on EPC basis should meet the following criteria:

Technical Criteria ()**

- A. *The bidder 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*

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been in Satisfactory Operation for a period of not less than Two year as on the date of deadline of submission of EOI.

OR

The Bidder 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 year as on the date of deadline of submission of EOI.

AND

B The bidder 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 EOI

Note:

- In case bidder is a holding company, the technical experience referred to in clause – A and B above as the case shall be of that holding company only (i.e excluding its subsidiary/ group companies).
- In case bidder is a subsidiary of a holding company, the technical experience referred to in clause – A and B above as the case may be shall be of that subsidiary company only (i.e excluding its holding company)

Financial Criteria ()**

1. Net Worth for last 3 financial year should be positive.
2. Minimum Average Annual Turnover (MAAT) for last three (3) years should be US\$ 900 Million or INR 66870 Million or equivalent. (Note: Annual total income as incorporated in the profit & loss accounts except non-recurring income e.g. sale of fixed assets.)
3. Shall have liquid assets (L.A.) or/and evidence of access to or availability of credit facilities of not less than US\$ 112 Million or INR 8321.6 Million or equivalent.

In case bidder 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 bidder 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.

Note on Technical and Financial Criteria:

- A. (**) At the time of invitation of this EOI, Technical and Financial Criteria is not yet finalized/available. It has been assumed it would be similar to as stipulated for the Pugalur-Trichur VSC HVDC project implemented by POWERGRID-India and the same reproduced above in this EOI.
- B. 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)

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The EOI Proposal

Interested companies who wish to join hands with BHEL for forming a suitable association to address forthcoming VSC HVDC project business in India may submit their Expression of Interest (EOI), **latest by 3.00 pm on 14th September, 2021.**

Expression of Interest (EOI) should be accompanied by:

- 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:

- a. **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.**

The proposal complete in all respect should be marked to:

Directly Marked to: (Hard+Soft)	Copy Marked to (Soft)
Parthasarathi Das General Manager – Marketing & Commercial Tel: +91-120-6748138 Mob: 9810-40-1728 e-mail: pdas@bhel.in	Vishal Shailendra Naidu Sr. Manager - Marketing Tel: +91-120-6748505 Mob: 9968-99-2545 e-mail: vsnaidu@bhel.in

To be sent at the following Office address (in hardcopy):

Transmission Business Group
Bharat Heavy Electricals Limited
Joy Tower, 10th Floor, C-20, 1/1A,
C Block, Phase 2, Industrial Area,
Sector 62, Noida-201301 (UP)

±320kV, 5000MW, Leh VSC HVDC**Project -Tender****Tentative Division of Work**

	Doc: Leh-5000mw-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	
		Leh	Kaithal / any other site
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		

±320kV, 5000MW, Leh VSC HVDC Project -Tender Tentative Division of Work			
	Doc: Leh-5000mw-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	
		Leh	Kaithal / any other site
1	33kV MVS/GIS Switchgear		
2	ACDB/DCDB		
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	Buildng 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.