

EXPRESSION OF INTEREST (EOI)

Bharat Heavy Electricals Limited, 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 EOI for formation of appropriate business association to jointly address forthcoming VSC HVDC project business opportunities in the in India.**

for further details please visit: www.bhel.com

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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 for formation of appropriate association to jointly address turnkey business opportunities in the VSC HVDC projects in India.

This Expression of Interest (Eoi) seeks response from Qualified OEMs, who are willing to be associated with BHEL through a business share or any other collaboration agreement basis, to execute projects in the area of VSC HVDC Projects in India.

About Bharat Heavy Electricals Limited (BHEL)

Bharat Heavy Electricals Limited (BHEL) is a Central Public Sector Enterprise, wherein Government of India is holding 63.06% 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 around US \$ 5 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 Defense with over 180 product offerings to meet the needs of these sectors. The energy sector covers generation, transmission and distribution equipment for hydro, thermal, nuclear and solar photo voltaic. BHEL has been in this business for more than 50 years and BHEL supplied equipment account for about 58% of the total thermal generating capacity in India. BHEL is also listed in stock exchanges of India. The company has 17 manufacturing units, 4 power sector regions, 8 service centers and 15 regional offices besides host of project sites spread all over India and abroad. BHEL's has its footprint in all the inhabited continents with references in 82 countries including Malaysia, Oman, Iraq, Syria Sudan, Libya, Cyprus, Malta, Afghanistan, Bangladesh, Bhutan, New Zealand etc. with cumulative overseas installed capacity of BHEL manufactured power plants nearing 10,000 MW. BHEL's highly skilled and committed manpower of approximately 40,000 employees, the state of art manufacturing facilities and latest technologies, has helped BHEL to deliver a consistent track record of performance. With the current order book exceeding US \$ 15 Billion*, BHEL is poised for excellent future growth. Our ongoing major technology tie-ups include agreements with KHI, Japan for SS Coaches & Bogies; GE, USA (for Super-Critical Boilers & Pulverisers and Gas Turbines); Siemens, Germany (for Steam Turbines, Generators and Condensers); Metso Automation Inc., Finland (for Control & Instrumentation); MHI, Japan (for Pumps); MHPS, Japan (for Flue Gas Desulfurization Systems); Vogt Power International, USA (for HRSG); GENP, Italy (for Compressors); Turbo Lufttechnik, Germany (for Fans) and Sheffield Forge Masters International, UK (for Forgings). **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

The 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 765 kV, HVDC Converter Stations, Reactive Power Compensation Schemes. The Group has capability to conduct System studies as required for above business.

BHEL has already installed many HVDC projects in India on EPC basis. For these projects BHEL has supplied major HVDC products like Converter transformers, Thyristor valves, Non FST panels, Capacitor bank, Reactors, Instrument transformers, SCADA etc. Major HVDC projects executed by BHEL jointly with OEMs are:

- 1500MW, \pm 500kV Rihand- Delhi HVDC project.
- 1500MW, \pm 500kV Chandrapur-Padghe HVDC project.
- 2500MW, \pm 500kV Balia - Bhiwadi HVDC Project
- World's largest multi terminal HVDC System of rating 6000MW, \pm 800kV for transporting power from North-East to Agra.
- Currently executing 6000 MW, \pm 800 kV Raigarh Pugalur HVDC Project

BHEL has state-of-art in-house facility for manufacturing & testing of Converter Transformers, Thyristor as well as IGBT based modules and its controls (non-FST), Power Capacitors, Insulators, etc. Further we have vast experience in construction and site management for various EHV and HVDC projects.

Background of EOI

Power Grid Corporation of India Limited (POWERGRID), a Central Transmission Utility (CTU), India's largest Electric Power Transmission Utility is engaged in Bulk Power transmission. Its responsibility includes planning, coordination, supervision and control over inter-State transmission system and operation of National & Regional Power Grids in India.

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. Most of the solar power generation have been planned in the Desert Plan of POWERGRID and it is proposed that evacuation of the power from the generation area to the demand area shall be envisaged through VSC based HVDC links. The project shall be implemented by POWERGRID and it is understood that POWERGRID is most likely to stipulate a minimum quantum of indigenous supplies from India for the major equipment like Interconnecting Transformers, IGBT modules, Controls, etc. for the VSC project. Considering above, and on the basis of with BHEL's manufacturing capabilities and vast EPC experience in the HVDC domain, BHEL

intends to have association with a leading company having requisite experience in execution of VSC HVDC projects on EPC basis 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 tender.

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

Technical Criteria

1.1 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 date of deadline of submission of EOI.*

1.2 In case 1.1 is not met, shall be considered meeting the technical experience provided he meets the following

1.2 (a) 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

1.2(b) 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.*

*** Satisfactory Operation -means the certificate issued by the employer certifying the operation without any adverse remarks**

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\$ 359.06 Million or INR 23741.20 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\$ 44.88 Million or INR 2967.65 Million or equivalent.

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: At the time of invitation of this EOI the Technical and Financial Criteria is not finalised by POWERGRID. Hence it has been assumed it would be similar to as stipulated for the Pugalur-Trichur VSC HVDC project which is presently under execution.

The EOI Proposal

Interested companies who wish to join hands with BHEL for forming a suitable association to address forthcoming HVDC VSC project business in India may submit their Expression of Interest by **3.00 pm on 30th April, 2018**. Expression of Interest 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".

The proposal complete in all respect may be sent to following address:

Additional General Manager- Marketing & Proposal Engg.

Transmission Business Group

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