



## Bharat Heavy Electricals Limited

(A Government of India Undertaking)

**Power Sector - Spares & Services Business Group  
(Renovation & Modernization Division)**

II Floor, Kribhco Bhawan, Sector 1, Noida - 201301

Ph: 0120-2474079; Fax: 0120- 2532158; E-mail: [bhupesh@bhel.in](mailto:bhupesh@bhel.in)

Ref: BHEL/EOI/LMZ Steam Turbine R&M

Date: 29.10.2020

Reference Number for Invitation to EOI:

**BHEL/EOI/LMZ Steam Turbine R&M**

### Technology Tie Up & Business Cooperation for 200/210 MW LMZ Steam Turbine R&M

#### CORRIGENDUM-III

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The time schedule of following activities in respect of invitation of EOI for Technology Tie Up & Business Cooperation for 200/210 MW LMZ Steam Turbine R&M are hereby extended as mentioned below. Terms & conditions related to GST & BHEL Guest House accommodation shall be as under;

Prices:	Prospective Partner to give tentative price exclusive of GST.
Hotel/GH facility to partner's experts & transportation.	Partner to arrange & bear all transportation on their own. Only Guest House facility at HEEP Hardwar can be provided on chargeable basis subject to availability.
<b>End date for receipt of responses against the invitation of EOI</b>	<b>10<sup>th</sup> Nov 2020, Tuesday.</b>

All other terms & conditions shall remain unchanged.

For further updates, please visit our website [www.bhel.com](http://www.bhel.com)

  
(Bhupesh Kumar)  
DGM/SSBG-R&M-Th



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Ref: BHEL/EOI/LMZ Steam Turbine R&M

Date: 13.10.2020

Reference Number for Invitation to EOI:

**BHEL/EOI/LMZ Steam Turbine R&M**

**Technology Tie Up & Business Cooperation  
for 200/210 MW LMZ Steam Turbine R&M**

### **CORRIGENDUM-II**

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The clause No. 4.3.1 of invitation of EOI for Technology Tie Up & Business Cooperation for 200/210 MW LMZ Steam Turbine R&M is amended as under: -

Clause No.	Amended Clause 4.3.1
Clause No.4.3.1, Page 8 of 27 of EOI Invitation.	The Prospective Partner(s) must comply the provisions of Ministry of Finance, Department of Expenditure, Public Procurement Division, Govt. of India Office Memorandum F. No. 6/18/2019-PPD dated 23.07.2020 regarding restrictions under Rule 144 (XI) of the General Financial Rules (GFRs), 2017. Any Prospective Partner(s) from a country which shares a land border with India will be eligible to submit their offer in this EOI only if registered with competent authority as per the provisions of above order.

All other terms & conditions shall remain unchanged.

For further updates, please visit our website [www.bhel.com](http://www.bhel.com)

*Bhupesh*  
13/10/2020  
(Bhupesh Kumar)  
DGM/SSBG-R&M-Th



## Bharat Heavy Electricals Limited

(A Government of India Undertaking)

**Power Sector - Spares & Services Business Group  
(Renovation & Modernization Division)**

II Floor, Kribhco Bhawan, Sector 1, Noida - 201301

Ph: 0120-2474079; Fax: 0120- 2532158; E-mail: [bhupesh@bhel.in](mailto:bhupesh@bhel.in)

Ref: BHEL/EOI/LMZ Steam Turbine R&M

Date: 09.10.2020

Reference Number for Invitation to EOI:

**BHEL/EOI/LMZ Steam Turbine R&M**

**Technology Tie Up & Business Cooperation  
for 200/210 MW LMZ Steam Turbine R&M**

### **CORRIGENDUM-I**

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The time schedule of following activities in respect of invitation of EOI for Technology Tie Up & Business Cooperation for 200/210 MW LMZ Steam Turbine R&M are hereby extended as under: -

End date for submission of queries	15 <sup>th</sup> October 2020, Thursday.
End date for receipt of responses against the invitation of EOI	31 <sup>st</sup> October 2020, Saturday.

All other terms & conditions shall remain unchanged.

For further updates, please visit our website [www.bhel.com](http://www.bhel.com)

*Bhum*  
09/10/2020  
(Bhupesh Kumar)  
DGM/SSBG-R&M-Th

BHARAT HEAVY ELECTRICALS LIMITED  
(A Government of India Undertaking)

NOTICE FOR  
INVITATION OF EXPRESSION OF INTEREST  
FOR  
BUSINESS COOPERATION AGREEMENT(BCA)  
FOR 200/210MW  
LMZ STEAM TURBINE R&M AND RETROFIT

REFERENCE NUMBER FOR INVITATION TO EOI:

BHEL/EOI/LMZ Steam Turbine R&M

LETTER OF INVITATION

Bharat Heavy Electricals Limited (BHEL) invites response from OEMs against this invitation of Expression of Interest (EOI) for Technology Tie Up for 200/210 MW LMZ Steam Turbine R&M. The scope of this EOI covers the following:

The objective of Retrofit and R&M of 200/210 MW LMZ Steam Turbine is to “Improve Efficiency/ Heat Rate and restore the name plate rating/uprating by introduction of new technology catering to the problems of technological obsolescence and also to have a reliable and suitable solution for flexible/ 2-shift/ cyclic operations & sustainable availability of the unit”. The retrofit and R&M solution shall be suitable for existing TG foundation without major modification & strengthening requirement in the existing TG foundation. Implementation of the above measures should also be able to extend the life by 15-20 years of reliable operation. In the above context, BHEL intends to go for tie-up with Original Equipment Manufacturer (OEM) of Steam Turbines having proven technology and experience in design, manufacturing, testing & commissioning of Power Plant Equipment as Partner. This EOI is published for seeking response from leading OEMs for the Scope of Work, Technology tie-up, Supply, Terms & Conditions/ Evaluation & Qualifying Criterion mentioned in the EOI documents. The prospective partner should be willing to associate with BHEL in a collaborative manner to meet the above stated requirements. BHEL shall receive offers 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 offers shall be prepared and submitted in accordance with such terms on or before the date specified in this EOI.

**EOI Reference Number: BHEL/EOI/LMZ Steam Turbine R&M**

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## **EOI Reference Number: BHEL/EOI/LMZ Steam Turbine R&M**

### SECTION-1

#### DISCLAIMER

1. The information contained in this Expression of Interest (EOI) document is provided to the Prospective Partner(s), by or on behalf of Bharat Heavy Electricals Limited (BHEL) or any of its employees or advisors on the terms and conditions set out in this EOI document and all other terms and conditions subject to which such information is provided.
2. The purpose of this EOI document is to provide the Prospective Partner(s) with information to assist the formulation of their response to EOI. This invitation to EOI document does not purport to contain all the information that each Prospective Partner may require. This invitation to 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 Prospective Partner(s) who reads or uses this invitation to EOI document. Each Prospective Partner should conduct his own investigations and analysis and should check the accuracy, reliability and completeness of the information in this invitation to EOI document and where necessary obtain independent advice from appropriate sources.
3. 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 invitation to EOI document.
4. BHEL may at any time, in its absolute discretion, but without being under any obligation to do so, modify, amend or supplement the information in this invitation to EOI document.
5. The issue of this EOI does not imply that BHEL is bound to select and shortlist any or all the Prospective Partner(s). Even after selection of suitable Prospective Partner(s) BHEL is not bound to proceed ahead with the participation in any or all business opportunities and in no case be responsible or liable for any commercial and consequential liabilities in any manner whatsoever.
6. The Prospective Partner(s) shall bear all costs associated with the preparation, technical discussion/presentation and submission of EOI. BHEL shall in no case be responsible or liable for these costs regardless of the conduct or outcome of the EOI process.
7. Canvassing in any form by the Prospective Partner(s) or by any other agency on their behalf shall lead to disqualification of their proposals against this invitation to EOI.

## EOI Reference Number: BHEL/EOI/LMZ Steam Turbine R&M

### SECTION-2

#### TIMELINES OF EOI PROCESS & CONTACT DETAILS

##### A. TIMELINES OF EOI PROCESS

The schedule of activities of the EOI Process shall be as follows -

Sl. No.	Description	Date & Day
1	Issue of invitation for EOI	24.09.2020 Thursday
2	Last date of receipt of queries (if any) against document of invitation for EOI.	07.10.2020 Wednesday
2	Last date of receipt of response against the invitation for EOI.	21.10.2020 Wednesday

##### B. CONTACT DETAILS:

All the correspondence shall be marked to the following:

Vikas Kumar Addl General Manager (SSBG) Bharat Heavy Electricals Limited (BHEL), (Spares & Services Business Group) Kribhco Bhawan, 2 <sup>nd</sup> Floor A8-10, Sector-1, Noida - 201301 Tel:91-120-2538093 E-Mail: <a href="mailto:vikaskumar@bhel.in">vikaskumar@bhel.in</a>	Bhupesh Kumar DGM (SSBG, R&M-Th) Bharat Heavy Electricals Limited (BHEL), (Spares & Services Business Group) Kribhco Bhawan, 2 <sup>nd</sup> Floor A8-10, Sector-1, Noida - 201301 Tel:91-120-2474079 Mob.91- 9711199629 E-Mail: <a href="mailto:bhupesh@bhel.in">bhupesh@bhel.in</a>
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SECTION -3

ABOUT BHEL

**3.1 ABOUT BHEL**

Bharat Heavy Electricals Limited (BHEL) is a Central Public Sector Enterprise under ministry of Heavy Industry and Public Enterprises, Government of India. 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 \$ 4.3 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, Water Management, Oil & Gas and Defence 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 photovoltaic. 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 16 manufacturing units, 4 power sector regions, 8 service centres and 15 regional offices besides host of project sites spread all over India and abroad. BHEL 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 34,000 employees, the state of art manufacturing facilities and latest technologies, have helped BHEL to deliver a consistent track record of performance. 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., KHI etc., together with technologies developed in its own R&D centres. BHEL invests more than 2.5% of its turnover on R&D and innovation.

More details about the entire range of BHEL's products and operations can be seen at [www.bhel.com](http://www.bhel.com).

SECTION - 4

DETAILS OF EXPRESSION OF INTEREST

**4.1 OBJECTIVE OF EOI:**

The objective of this EOI is selection/enlistment of suitable Partner(s) for exclusive tie-up for jointly addressing the business opportunities for R&M of 200/210 MW LMZ Steam Turbine in India with scope split as per SECTION 4(A) for Design & Engineering and scope split as per SECTION 4(B) for, manufacturing, supply, E&C etc. for initial 3 Units/Sets. The selected partner shall progressively share complete Technical inputs with transfer of technology to BHEL by 3<sup>rd</sup> Unit/Set of R&M of 200/210 MW LMZ Steam Turbine and BHEL shall be given right to reuse all the design, engineering, manufacturing, E&C documents, software etc. by the Partner. Business cooperation agreement /Joint Association Agreement (JAA)/ Memorandum of Understanding (MoU) will be signed with the selected Partner(s).

The BCA / JAA / MoU will be an opportunity for the partner(s) to work with India's one of the largest engineering and manufacturing enterprise.

**4.2 INSTRUCTIONS**

**4.2.1 Exclusivity:**

- (a) Selected Partner(s) shall exclusively address the R&M of LMZ Steam Turbine with BHEL. BHEL & Partner(s) will jointly address the business opportunities for LMZ Steam Turbine Sets with scope split as per SECTION 4(A) for Design, Engineering and as per SECTION 4(B) for manufacturing, supply, E&C etc. for initial 3 sets. The selected partner to progressively share complete Technical inputs with transfer of technology to BHEL by 3<sup>rd</sup> Unit/Set of R&M of 200/210 MW LMZ Steam Turbine and BHEL shall be given right to reuse all the design, engineering, manufacturing, E&C documents, software etc. shared by the Partner with BHEL.
- (b) Selected Partner(s) or their parent firm/associates/affiliates cannot directly or indirectly address the business opportunities either individually or in association with other parties in India.

**4.2.2 Language of proposal:** All correspondences and documents related to EOI submission shall be in English language, provided that any printed literature furnished by the Prospective Partner(s) 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 proposal the English translation shall govern.

**4.2.3** A prospective partner (s) requiring any clarification to the EOI documents may notify the same through e-mail at the email ID indicated hereinabove in Section 2 of this EOI. BHEL will respond to any request for clarification received within specified time. Prospective partner (s) are also advised to regularly visit website regarding posting of amendment of EOI if any.

**4.2.4** BHEL at their sole discretion may inspect the Prospective Partner works/office/reference project sites etc. for the purpose of evaluation, if required.

## **EOI Reference Number: BHEL/EOI/LMZ Steam Turbine R&M**

### **4.2.5 Signing of EOI / Application**

Prospective partner(s) must be registered under relevant applicable Indian/ foreign laws and shall submit their response to EOI along with requisite documents authenticated by an authorised person from any of its offices who will be interacting with BHEL during evaluation process. All pages of the EOI documents including formats and annexures, and all pages of this Invitation of EOI documents together with subsequent clarifications / corrigendum issued shall be duly signed, dated and stamped by the authorised signatory.

### **4.2.6 Bid Submission Guidelines**

The Partner shall submit their bids either in the tender box placed at BHEL, SSBG, Kribhco Bhawan 2<sup>nd</sup> Floor, A8-10 Sector 1, Noida – 201301 or send the same by Pre-Paid Speed Post / Registered Post or by recognised courier so that they are received on / or before 14:00 Hrs on EOI submission due date. In exceptional cases, where due to bulky size of the documents, it is not possible to drop the bid in the tender box, the bid documents can be handed over to the BHEL SSBG Noida dispatch/receipt section personnel.

The EOI shall be submitted in One Original plus 3 Copies in separate envelop indicating as Original and Copy along with one set in CD/DVD/Pen Drive. All the four envelop (One Original and 3 Copies) and one set in CD/DVD/Pen Drive shall be kept in one sealed envelope/box and all the envelops shall be superscripted with "EOI for TECHNOLOGY TIE-UP FOR 200/210MW LMZ STEAM TURBINE R&M AND RETROFIT" along with EOI reference number, submission date, name & address of the Prospective Partner.

### **4.3 ELIGIBILITY CONDITIONS FOR PROSPECTIVE PARTNER(S):** In addition to eligibility and prequalification criteria specified under SECTION 4(C) following is to be fulfilled by prospective Partner.

4.3.1 Prospective Partner(s) may have the nationality of any country. The Prospective Partner(s) shall be deemed to have the nationality of a country if the Prospective Partner(s) is constituted, incorporated or registered and operates in conformity with the provisions of the laws of that country, as evidenced by its articles of incorporation or documents of constitution, and its registration documents.

4.3.2 The Prospective Partner(s) can be Private, Public or Government owned legal entity. Government entity shall be eligible only if they can establish that:

- I. They are legally and financially autonomous, and
- II. They operate under commercial law

4.3.3 Only those Prospective Partner(s) can participate in this EOI, who wish to exclusively tie-up with BHEL strictly as per clause no. 4.2.1 above.

4.3.4 Prospective Partner(s) who have been barred/blacklisted by the Central/State Governments or by any entity controlled by Central/State Governments from participating in any project, as on date of submission of EOI, shall not be eligible to submit the EOI.

4.3.5 Prospective Partner(s), who has been barred/blacklisted by the World Bank, Japan International

## **EOI Reference Number: BHEL/EOI/LMZ Steam Turbine R&M**

Cooperation Agency (JICA) or any other International Financing Institution, from participating in any project, as on date of submission of EOI, shall not be eligible to submit the EOI.

- 4.3.6 Prospective Partner(s) who has been expelled from any project or contract by any Government/Semi Government entity in last 5 years, prior to date of submission of EOI, shall not be eligible to submit the EOI.

### **4.4 PROCESS TO BE CONFIDENTIAL:**

Information relating to the examination, clarification, comparison and evaluation of responses submitted against the EOI and recommendations of BHEL on selection process of partner shall not be disclosed to Prospective Partner(s). Any effort by Prospective Partner(s) to influence BHEL in this regard may result in the rejection of their proposal.

### **4.5 MISCELLANEOUS:**

#### **4.5.1 Right to accept or reject any or all Applications:**

- i. Notwithstanding anything contained in this invitation to EOI, BHEL reserves the right to accept or reject any EOI and to annul the EOI Process and reject all EOI's, at any time without any liability or any obligation for such acceptance, rejection or annulment and without assigning any reasons, thereof.
- ii. BHEL reserves the right to disqualify any Prospective Partner during or after completion of EOI process, if it is found there was a material misrepresentation by any such Prospective Partner or the Prospective Partner fails to provide within the specified time, supplemental information sought by BHEL.
- iii. BHEL reserves the right to verify all statements, information and documents submitted by the Prospective Partner in the EOI. Any such verification or lack of such verification by BHEL shall not relieve the Prospective Partner of his obligations or liabilities hereunder nor will it affect any rights of BHEL.

#### **4.5.2 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 this EOI process.

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## SECTION -4(A)

## SCOPE SPLIT W.R.T. DESIGN &amp; ENGINEERING

The Prospective Partner shall perform complete Design and Engineering activities & provide Engineering information w.r.t. Steam Turbine & its systems/ auxiliaries for efficient & reliable long term operation as per tender requirements. Engineering work will also include the activities related to interface issues with other equipment for optimization of complete thermal cycle to meet market requirements. The Engineering scope is for Steam Turbine area to achieve better Heat Rate and R&M / Retrofit solution to suit existing footprint and TG foundation as per tender requirement of utilities. However, modifications, if required in other associated areas/ systems/ interfaces etc. also shall be informed by the Prospective Partner for taking care of system/ equipment requirements.

S L	DESCRIPTION	SCOPE SPLIT		REMARKS
		PARTNER	BHEL	
1	Design & Engineering for the Turbine & Valves along with High pressure EHA type Governing system suitable for flexible/ 2-shift/ cyclic operations/RGMO compliance.	Y	N	Partner to share relevant drawings/documents with BHEL
2	Detail Design & Engineering of Bearing Pedestals, Journal Bearings, Radial Thrust & Journal Bearing, Cross Over Pipe Assembly and Turning Gear / Motor Arrangements, etc. are also included.	Y	N	Partner to share relevant drawings/documents with BHEL
3	Performance-Guarantees related to Steam Turbine.	Y	N	Partner to share relevant performance test/procedure drawings/documents/reports with BHEL
4	Performance Guarantee Test conductance at site.	N	Y	Partner to provide technical assistance/supervision during conductance of test at Site ( For initial 2 sets)
5	It is required that the proposed retrofit/ R&M of Steam Turbine will be suitable for existing TG foundation. The partner to furnish the proposed loading pattern & load details on TG foundation pertaining to Steam Turbine R&M / retrofit proposal.	Y	N	Partner to share relevant drawings/documents with BHEL

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6	<p>Steam Turbine Engineering Activities/ Analysis namely:</p> <ul style="list-style-type: none"> <li>• Thermodynamic Analysis,</li> <li>• Component level mechanical analysis of offered retrofit components of all the three turbine cylinders &amp; valves,</li> <li>• Thermal-Expansion Calculations of Rotors &amp; Casings (Axial, Differential &amp; Radial),</li> <li>• Jacking/ Lube Oil calculations,</li> <li>• Bearing-Design, Calculation of Load on Bearings (maximum loading capacity of each Bearing and maximum Thrust Bearing capacity of Thrust Bearing), start-up curves</li> <li>• Rotor-Train Dynamic Analysis of complete train including existing Generator,</li> <li>• Catenary-Calculations/ Load on Foundation/ Structural/ Resonance/ Dynamic Analysis &amp;</li> <li>• Any other analysis which might be required during execution &amp; successful completion of the project.</li> </ul>	Y	N	<p>Partner to share with BHEL the process/ results/ outputs/ datasheets/ design-reports etc. of these activities</p> <p>Partner to also share the design calculations and required software tools to enable BHEL to carry out the design and resolution of shop/site issues independently.</p>
7	<p>Information related to all relevant:</p> <ul style="list-style-type: none"> <li>• Manufacturing drawings of main supply &amp; spares including specifications for materials,</li> <li>• Drawings of long-lead items including forgings &amp; castings,</li> <li>• Technical details and specifications of bought out items &amp; their test requirements,</li> <li>• Shop &amp; site protocols,</li> <li>• Quality-checks,</li> <li>• Technological-process information,</li> <li>• Shop &amp; site welding schedules,</li> <li>• Over-speeding &amp; Balancing records (along with acceptance norm and specification) of complete steam turbine scope (for both parties scope of work &amp; supplies) &amp;</li> <li>• Any other relevant records/ data/ results/ checklists etc. to enable manufacturing of the Turbine and its components at BHEL works.</li> </ul>	Y	N	<p>Partner to furnish required drawings/ documents to BHEL</p>
8	Erection & Commissioning support at site.	Y	N	<p>Partner to provide technical assistance/supervision at</p>

**EOI Reference Number: BHEL/EOI/LMZ Steam Turbine R&M**

				Site
9	Turbine Integral Piping Systems Schemes/ drawings (if changes required) to suit the renovated design.	Y	N	
10	Information related to O&M manuals with Start-up & Shutdown procedures, Erection & Commissioning manuals including site Erection & Commissioning drawings for complete Steam Turbine.	Y	N	
11	Information (but not limited to this) related to Controls & Instrumentation (C&I) Engineering : <ul style="list-style-type: none"> <li>• Operational philosophy of Governing System for the Turbine along with all related technical details.</li> <li>• Details of TSI system including data sheet of sensors &amp; their mounting accessories</li> <li>• FCDs/ logics/ Schemes of Turbine Control &amp; Protection system with all required &amp; applicable data/ curves/ set-points etc.</li> <li>• If other information/ document if required during project execution w.r.t C&amp;I and electrical engineering area for TG controls</li> </ul>	Y	N	Implementation of Control System in BHEL scope.
12	Technical-Inputs w.r.t. Interfaces, Specifications for Auxiliaries & Boiler (if changes required).	Y	N	Partner to furnish relevant documents to BHEL
13	Engineering support during project execution at any stage, if required.	Y	N	Partner to support BHEL
14	Investigation & Root-Cause Analysis of the important issues if arises post-commissioning till guarantee/ warranty/ defect liability period with the customer.	Y	N	Partner to support BHEL
15	Information related to Partner's approved vendors who will be associated in the project.	Y	N	Partner to share relevant details with BHEL
16	System-Engineering and their Integration with the existing systems and equipments at site	N	Y	Partner to provide Interface & Auxiliary Engineering inputs to BHEL wherever

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				required
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**NOTES:**

1. The partner to provide Design & Engineering and manufacturing information for Steam Turbine for first 3 Unit/Sets including technical inputs for their systems/auxiliaries. The selected partner shall progressively share complete Technical inputs with transfer of technology to BHEL by 3<sup>rd</sup> Unit/Set of R&M of 200/210 MW LMZ Steam Turbine and BHEL shall be given right to reuse all the design, engineering, manufacturing, E&C documents, software etc. by the Partner. After 3 Units/sets, for 4<sup>th</sup> /5<sup>th</sup> Unit/Set, further support/scope will be discussed and mutually agreed on case to case basis between BHEL & the partner.
2. The partner to also provide technical Trainings to BHEL engineers at their works/premises on mutually agreed terms and conditions.



# EOI Reference Number: BHEL/EOI/LMZ Steam Turbine R&M

## SECTION -4(B)

Scope Split for Manufacturing and/ or Supply, PG Test.

Scope Split for Manufacturing and/ or Supply								
S.N.	ASSEMBLY DESCRIPTION	SCOPE SPLIT						REMARKS
		I SET		II SET		III SET		
		BHEL Scope	Partner Scope	BHEL Scope	Partner Scope	BHEL Scope	Partner Scope	
1	Fully bladed, assembled & dynamically balanced HP Rotor	N	Y	N	Y	-	-	HPT Rotor Assembly, Balancing & Over speeding at BHEL-Haridwar works under supervision of the partner's expert for 3rd set.
	1a-HPT Shaft	-	-	-	-	Y	N	
	1b-HPT Rotor Blades & Blading Materials	-	-	-	-	Y	N	
2	HPT Inner-Casing/ Liners as applicable	Y	N	Y	N	Y	N	
3	HPT Stationary Blades and Blading Materials/ Diaphragms as applicable	Y	N	Y	N	Y	N	
4	HPT Outer-Casing, Glands Assembly & other Assembly Components required for complete assembly of HPT	Y	N	Y	N	Y	N	Final HPT assembly including flowpath checking will be carried out in BHEL-Haridwar works (for all 3sets) under the supervision of partner's expert (for initial 2 sets). HP rotor will be required at

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								BHEL-Haridwar works for flowpath checking (for initial 2 sets).
5	Fully bladed, assembled & dynamically balanced IP Rotor	N	Y	-	-	-	-	IPT Rotor Assembly, Balancing & Over speeding at BHEL-Haridwar works (for 2nd & 3rd sets) under supervision of the partner's expert.
	5a-IPT Shaft	-	-	Y	N	Y	N	
	5b-IPT Rotor Blades & Blading Materials	-	-	Y	N	Y	N	
6	IPT Inner-Casing/ Liners as applicable	Y	N	N	Y	Y	N	
7	IPT Stationary Blades and Blading Materials/ Diaphragms as applicable	Y	N	N	Y	Y	N	
8	IPT Outer-Casing, Glands Assembly & other Assembly Components required for complete assembly of IPT	Y	N	Y	N	Y	N	Final IPT assembly including flowpath checking will be carried out in BHEL-Haridwar works (for all 3 sets) under the supervision of partner's expert (for initial 2 sets). IP rotor will be required at BHEL-Haridwar works for flowpath checking for first set. IPT Inner-Casing/ Liners,

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								Stationary Blades and Blading Materials/ Diaphragms will be required at BHEL-Haridwar works for flowpath checking & final assembly (for 2nd set only).
9	Fully bladed, assembled & dynamically balanced LP Rotor	-	-	-	-	N	Y	LPT Rotor Assembly, Balancing & Over speeding at BHEL-Haridwar works under supervision of the partner's expert (for initial 2 sets).
	9a-LPT Shaft	Y	N	Y	N	-	-	
	9b-LPT Rotor Blades & Blading Materials	N	Y	Y	N	-	-	
10	LPT Diaphragms/ Liners/ Inner Casing as applicable	N	Y	N	Y	Y	N	
11	LPT Internals, Flowpath & Assembly components including items required for Strengthening & Modernisation of LPT Exhausthoods & Middle part	Y	N	N	Y	Y	N	

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12	LP Outer Casing modifications/ changes, if any	Y	N	Y	N	Y	N	
13	Cross over pipe including compensators	Y	N	Y	N	Y	N	
14	Pedestals & Bearings	Y	N	Y	N	Y	N	
15	Turbine Governing & Control System (High Pressure 160 bar Control fluid based Electro-Hydraulic Actuator type)	Y	N	Y	N	Y	N	
16	HP Stop & Control Valves and Piping assemblies suitable for 160 bar EHA	Y	N	Y	N	Y	N	
17	IP Stop & Control Valves and Piping assemblies suitable for 160 bar EHA	Y	N	Y	N	Y	N	
18	Turning Gear, MOP & Thermal Insulation	Y	N	Y	N	Y	N	
19	BOP, Steam Turbine Auxiliaries & Integral Systems (for e.g.-Lube-Oil, Jacking-Oil, Gland-Seal systems etc.)	Y	N	Y	N	Y	N	

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20	Steam Turbine Erection & Commissioning	Y	N	Y	N	Y	N	partner to provide technical support at site during Erection & Commissioning
21	PG test to be conducted by BHEL (Turbine related inputs by partner)	Y	N	Y	N	Y	N	Partner to provide technical support during PG Test( for initial 2 sets)
22	Spares (Mandatory & Recommended) of all Steam Turbine Equipments/ Items	Y	N	Y	N	Y	N	Partner to provide manufacturing documents
23	Tools & Tackles of all Steam Turbine Equipments/ Items	Y	N	Y	N	Y	N	Partner to provide manufacturing documents
24	Modification & Strengthening of foundation-if required	Y	N	Y	N	Y	N	Partner to furnish the required information, if required
25	Controls & Instrumentation Engineering & Supply	Y	N	Y	N	Y	N	Partner to furnish the Steam Turbine related inputs

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### SECTION -4(C)

#### ELIGIBILITY AND PREQUALIFICATION CRITERIA

The determination of eligibility will take into account the experience and past performance of the Prospective Partner(s); it will be based upon an examination of documentary evidence submitted by the Prospective Partner(s) as well as such other information, as BHEL deems necessary and appropriate.			
ELIGIBILITY CRITERIA: TECHNICAL			
S N	Subject	Must Meet Requirement/s (PQR)	Document Submission requirement/s
1	OEM	The Prospective Partner should be an Original Equipment Manufacturer (OEM) having proven technology & experience in Design, Engineering, Manufacturing, Erection, and Commissioning & Testing of Steam Turbines.	Self-declaration certificate
2	Experience	The prospective partner should have executed comprehensive (i.e. HP, IP & LP Turbines in a single unit rating of 200/210MW or above) R&M/ Retrofit of LMZ make Steam Turbine. The partner must have experience in the area of R&M/ Retrofit related to Design, Engineering, Manufacturing & Supply of LMZ make 200/210MW Steam Turbine and should have commissioned such Steam Turbine of at least one (1) unit of 200/210 MW or above capacity in at least one (1) fossil fuel fired thermal power station, which is in successful operation for at least two (2) years as on closing date of EOI.	Supporting Experience list/documents alongwith declaration certificate as per Annexure-I.
3	TG Foundation	The partner shall use the existing TG foundation without any major modification for their modified equipments (Steam Turbine etc.) and R&M solution must be suitable for existing TG foundation. There should not be any load increase on TG foundation w.r.t. the existing load of the TG set after retrofit/R&M work.	Supporting documents/drawings of their successful TG sets after R&M reflecting the weight comparison(pre & post R&M) on TG foundation

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4	Heat rate	The partner should offer Heat-Rate commensurate with prevailing Heat-Rate in the market. Turbine Heat Rate higher than 1940 kCal/kWhr shall not be considered. (Please refer NOTE 1. below for terminal boundary parameters for calculation of Heat Rate )	Partner to quote their Guaranteed Heat Rate value (which must be $\leq$ 1940 kCal/kWhr ) along with the price section only and same shall be evaluated along with the price. Lowest quoted heat rate by techno-commercially qualified probable partner shall be taken as base value for loading and loading will be @INR2.0 Cr per kCal/kWhr for other prospective partner.
5.	Scope-split w.r.t. Design & Engineering, Manufacturing, supply etc.	The partner must accept & comply for scope split as per Section-4(A) and Section-4(B) of this EOI document.	

NOTE 1.	Following terminal boundary parameters are to be considered for calculating Heat Rate	
	Main Steam Pressure	130 ata
	Main Steam Temperature	535 Deg C
	Re-heat Temperature	535 Deg C
	Re-Heat Circuit Pr. Drop	10% of CRH Pr
	Condenser Pr.	0.1047 ata
	FFWT	246 Deg C
	Thermal Cycle Configuration	Typical 210 MW LMZ Thermal Cycle

SECTION -5

EVALUATION METHODOLOGY:

- In case Prospective Partner(s) is not meeting “Must Meet Requirements” for Scope split w.r.t. Design & Engg. i.e. SECTION-4(A) of our EOI document, BHEL reserves its right to reject the proposal /offer.
- Response of the Prospective Partner(s) who do not fulfil all other Eligibility and Prequalification Criteria as per SECTION-4(C), shall not be considered for evaluation. Any deviation to the above Parameters shall lead to rejection of the proposal/offer
- Evaluation shall be done based on lowest indicative price along with loading on account of Heat Rate offered by the Prospective Partner(s) as per Annexure-A, subject to;
  - Acceptance and willingness of prospective partner(s) to share complete Technical inputs with transfer of technology to BHEL by 3<sup>rd</sup> Unit/Set of R&M of 200/210 MW LMZ Steam Turbine and acceptance to grant BHEL the rights to reuse all the design, engineering, manufacturing, E&C documents, software etc. with BHEL.
  - Other conditions and requirements specified in the document, amendments, clarifications.
- BHEL shall have full discretion in finalizing the partner(s) to meet its requirement.

BHEL will evaluate the EOI of the partners based on the submitted reference projects at the time of EOI submission in first instance itself. No additional / replacement of project is allowed after submission of the EOI. Only the information/ documents of the projects already submitted if required, can be substantiated after submission of EOI.



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## Annexure-A

## FORMAT TO QUOTE INDICATIVE PRICE &amp; HEAT RATE FOR EVALUATION

S N	Subject	To be quoted by Prospective Partner in INR only.	Remarks
1.	Indicative Price	Indicative Price for 1 <sup>st</sup> Unit/Set along with break-up of each items as per Annexure-B.  Note: BHEL shall not be paying any separate charges for Design, Engineering, giving rights to reuse all the design, engineering, manufacturing, E&C documents, software etc.	Indicative Price quoted by prospective partner(s) shall be Loaded on account of Heat Rate (@INR 2 Cr. for every kCal/kWhr higher Guaranteed Heat Rate quoted, compared with lowest Heat Rate quoted by any prospective partner.
1.1	Price for Manufacturing & Supply as per Section – 4(B) Scope Split.	Indicative Price for 1 <sup>st</sup> Unit/Set (in INR only) along with break-up of each items as per Section – 4(B) Scope Split.	Indicative price quoted by prospective partner(s) will be kept as reference and will be compared while finalising the price submitted by the partner(s) against firm enquiry.
1.2	Price for E&C & PG Test support. as per Section – 4(B) scope split.	Indicative Price for 1 Unit (in INR only).	
2.	Guaranteed Heat rate with terminal boundary parameters mentioned in NOTE1, under SECTION-4(C)	Lower offered Guaranteed Heat-Rate	Partner's to quote the figure of Guaranteed Heat Rate will be loading by INR 2 Cr. for every kCal/kWhr higher Guaranteed Heat Rate quoted over the lowest Guaranteed Heat Rate quoted by any prospective partner.

Based on evaluated indicative price, one or more (preferably one) partner(s) will be enlisted.

Note: Order will be placed against actual tender requirement of customer and offer submitted by the enlisted party/parties against BHEL's firm enquiry.

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## Annexure-B

Format to quote item wise price break-up. Partner has to quote for all the below listed items for one set irrespective of scope split as given in section 4(B).

S.N.	ASSEMBLY DESCRIPTION	Price in INR	Remarks
1	Fully bladed, assembled & dynamically balanced HP Rotor		
	1a-HPT Shaft		
	1b-HPT Rotor Blades & Blading Materials		
2	HPT Inner-Casing/ Liners as applicable		
3	HPT Stationary Blades and Blading Materials/ Diaphragms as applicable		
4	HPT Outer-Casing, Glands Assembly & other Assembly Components required for complete assembly of HPT		
5	Fully bladed, assembled & dynamically balanced IP Rotor		
	5a-IPT Shaft		
	5b-IPT Rotor Blades & Blading Materials		
6	IPT Inner-Casing/ Liners as applicable		
7	IPT Stationary Blades and Blading Materials/ Diaphragms as applicable		
8	IPT Outer-Casing, Glands Assembly & other Assembly Components required for complete assembly of IPT		
9	Fully bladed, assembled & dynamically balanced LP Rotor		

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	9a-LPT Shaft		
	9b-LPT Rotor Blades & Blading Materials		
10	LPT Diaphragms/ Liners/ Inner Casing as applicable		
11	LPT Internals, Flowpath & Assembly components including items required for Strengthening & Modernisation of LPT Exhausthoods & Middle part		
12	LP Outer Casing modifications/ changes, if any		
13	Cross over pipe including compensators		
14	Pedestals & Bearings		
15	Turbine Governing & Control System (High Pressure 160 bar Control fluid based Electro-Hydraulic Actuator type)		
16	HP Stop & Control Valves and Piping assemblies suitable for 160 bar EHA		
17	IP Stop & Control Valves and Piping assemblies suitable for 160 bar EHA		
18	Turning Gear, MOP & Thermal Insulation		
19	BOP, Steam Turbine Auxiliaries & Integral Systems (for e.g.-Lube-Oil, Jacking-Oil, Gland-Seal systems etc.)		
20	Steam Turbine Erection & Commissioning		Supervision Charges / Technical support by Partner's Experts at site during erection and commissioning
21	PG test to be conducted by BHEL (Turbine related inputs by partner)		Supervision Charges / Technical support by Partner's Experts at site during PG Test

**EOI Reference Number: BHEL/EOI/LMZ Steam Turbine R&M**

22	Spares (Mandatory & Recommended) of all Steam Turbine Equipments/ Items		
23	Tools & Tackles of all Steam Turbine Equipments/ Items		
24	Modification & Strengthening of foundation-if required		
25	Controls & Instrumentation Engineering & Supply		
26	Supervision Charges of Partner's Experts at BHEL Haridwar works for HPT Rotor Assembly. Balancing and Overspeed		
27	Supervision Charges of Partner's Experts at BHEL Haridwar works for Final HPT Assembly including flow path checking		
28	Supervision Charges of Partner's Experts at BHEL Haridwar works for IPT Rotor Assembly. Balancing and Overspeed		
29	Supervision Charges of Partner's Experts at BHEL Haridwar works for Final IPT Assembly including flow path checking		
30	Supervision Charges of Partner's Experts at BHEL Haridwar works for LPT Rotor Assembly. Balancing and Overspeed		

Note: For evaluation purpose, the indicative prices against the partner's scope as per section 4(B) for all three sets will be considered. Supervision charges will also be considered for evaluation purpose as per scope split among three sets as mentioned in SECTION-4(B) Remarks column.

ANNEXURE -1

SPECIFIC EXPERIENCE OF PARTNER

**This form to be completed by the Partner and Required Information to be furnished along with EOI**

**SPECIFIC EXPERIENCE**

(To be completed by the Partner)

Partner's Legal Name: \_\_\_\_\_ Date: \_\_\_\_\_

Reference Plant, details of which have been declared in this Form shall only be considered by BHEL to ascertain for meeting Qualification Requirements (QR) and Partner wishing to provide additional Reference Plants can give the them in similar form.

Sl. No.	Item Description	Particulars to be Furnished by the Partner
1.0	Name of Partner	
1.1	Name of Collaborator/Associate, if applicable	
1.2	Should have executed comprehensive (i.e. HP, IP & LP Turbines in a single unit rating of 200/210MW or above) R&M/ Retrofit of LMZ make Steam Turbine. The partner must have experience in the area of R&M/ Retrofit related to Design, Engineering, Manufacturing & Supply of LMZ make 200/210MW Steam Turbine and should have commissioned such Steam Turbine of at least one (1) unit of 200/210 MW or above capacity in at least one (1) fossil fuel fired thermal power station, which is in successful operation for at least two (2) years as on the date of Invitation for Bid (IFB).	
	(a) Name of Client	
	(b) Name of TPS	
	(c) Unit No.	
	(d) Capacity of Unit (MW)	
	(e) Contact Person	
	(f) Address in full	
	(g) Telephone No	
	(h) Email	
1.3	Purchase Order / Contract / LOA	

**EOI Reference Number: BHEL/EOI/LMZ Steam Turbine R&M**

	(a) Number	
	(b) Date	
1.4	Scope of work covered Capacity (R&M/ Retrofit Work). The Scope of Work should clearly mention individual Steam Turbine Modules, valves, High Pressure Governing System & Comprehensive R&M work (complete TG set including Governing-System)	
	(a) Designed	YES <input type="checkbox"/> NO <input type="checkbox"/> (Tick whichever is applicable)
	(b) Engineered	YES <input type="checkbox"/> NO <input type="checkbox"/> (Tick whichever is applicable)
	(c) Manufactured	YES <input type="checkbox"/> NO <input type="checkbox"/> (Tick whichever is applicable)
	(d) Supplied	YES <input type="checkbox"/> NO <input type="checkbox"/> (Tick whichever is applicable)
	(e) Erected	YES <input type="checkbox"/> NO <input type="checkbox"/> (Tick whichever is applicable)
	(f) Commissioned	YES <input type="checkbox"/> NO <input type="checkbox"/> (Tick whichever is applicable)
	(g) Successfully Completed Performance Guarantee Test <b>PG Test Reports of executed projects. Partner to inform heat rate/ efficiency for the recent R&amp;M Tenders.</b>	YES <input type="checkbox"/> NO <input type="checkbox"/> (Tick whichever is applicable)
	(h) Date of Commissioning of the Unit	
1.5	Whether client's certificate in support of specified QR conditions enclosed?	YES <input type="checkbox"/> NO <input type="checkbox"/> (Tick whichever is applicable)
1.6	Undertaking that it is not black listed or debarred in India by any agency	YES <input type="checkbox"/> NO <input type="checkbox"/> (Tick whichever is applicable)

Date:

(Signature).....

Place:

(Printed Name).....

(Designation).....

(Official Seal).....