



EXPRESSION OF INTEREST

FOR

Selection of vendor for
Manufacturing & Supply of Machined Bogie Frames of
Vande Bharat Trainset

Issued by:

Bharat Heavy Electricals Limited, having registered office at
BHEL House, Siri Fort New Delhi-110049 and
also office at

Locomotive Engineering Division,
BHEL, Jhansi - 284120,
Uttar Pradesh, INDIA
(hereinafter referred to as 'BHEL')



**Expression of Interest (Eoi) for Selection of Vendors For
Manufacturing & Supply of Vande Bharat Trainset Bogie Frame
Locomotive Engineering Division**

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 ongoing or continuing relationship or commitment with any party or person. This is not an offer or invitation to enter into an agreement of any kind with any party.

Though adequate care has been taken in the preparation of this EOI document, the interested firms shall satisfy themselves 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.

The issue of this EOI does not imply that BHEL is bound to select and shortlist Applicant(s) for next stage or to enter into any agreement(s) with any Applicant(s). BHEL reserves all right to reject any applications submitted in response to this EOI document at any stage without assigning any reasons thereof. 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, 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.



1.0 INTRODUCTION

This Expression of Interest (Eoi) seeks response from vendors who are involved in manufacturing and or have past experience of manufacturing bogie frames of railway rolling stocks.

2.0 ABOUT BHEL

Bharat Heavy Electricals Limited (BHEL) is a Central Public Sector Enterprise, wherein Government of India is holding 63.17% of its equity. One of the largest engineering and manufacturing companies of its kind in India having a turnover of more than USD 4 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 a mammoth 20,000 MW per annum capability for manufacturing of power generation equipment. With a widespread network of 16 manufacturing facilities, 2 repair units, 4 regional offices, 8 service centres, 1 subsidiary, 3 active joint ventures, 15 regional marketing centres, 3 overseas offices and current project execution at more than 150 project sites across India and abroad, BHEL manufactures a wide range of high quality & reliable products adhering to national and international standards.

With key focus on project execution, the worldwide installed base of power generating equipment supplied by BHEL has exceeded 185 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 83 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.

BHEL has been designing and manufacturing rolling stock for rail and urban transportation. BHEL has also been manufacturing Motors, Power electronics and Controllers for various transportation applications at its various factories.

In transportation sector, BHEL is into the manufacture of complete electric and diesel electric locomotives and electrical assemblies/components including traction motors, traction transformers, power & auxiliary converters and controls, gear wheels etc. We are a regular supplier of propulsion equipment of ACEMU/MEMU. India's first air-conditioned ACEMU train operational in Mumbai is equipped with BHEL's electrics and propulsion system.

At our Jhansi plant, we manufacture complete Electric Locomotives upto 6000 HP rating for mainline application of Indian Railways, Diesel Electric Locomotives from 350 HP to 3250 BHP rating. Till date, we have supplied cumulatively more than 750 nos. of main line electric locomotives to Indian Railways and diesel electric locomotives for shunting operations to various industries.

Our Jhansi plant have an installed capacity of 75 nos. locomotives per year. At Jhansi, we have complete state-of-the-art facilities for manufacturing, fabrication and testing of bogies, loco shells, under frames and other mechanical components of locomotives. We have recently developed India's first state-of-the-



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art WAG7 Electric Locomotive with regenerative capabilities. We have also developed India's first Traction Motor for 9000HP Electric Locomotives.

Among electrical propulsion equipment, we manufacture and supply traction motors, traction transformers, power converters(IGBT) & controls, auxiliary converters(IGBT) and vehicle control units for electric locomotives, diesel electric locomotives, EMUs, DEMUs & and metros trains of Indian Railways. Our manufacturing range includes complete solution for ACEMU/MEMU, IGBT based 3-phase drive equipment upto 6000HP rating. BHEL has also been in the forefront of providing maintenance and spares/replacement support to Indian Railways for their locomotive fleet. We have full-fledged service department located at major centres in the country.

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



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3.0 PURPOSE

- 3.1 Consortium of M/s BHEL and M/s Titagarh Rail Systems Limited (formerly called M/s Titagarh Wagons Limited) has been awarded an order for manufacturing, supplying and maintaining 80 Vande Bharat Trainsets. In this project, BHEL Jhansi is required to deliver fully assembled bogies for final coach assembly.
- 3.2 The intent of this Expression of Interest hereinafter referred to as the "EOI" is to:
- 3.2.1 Invite applications from interested organizations / companies (the "Applicant") who are willing to supply machined bogie frame of Vande Bharat Trainset to BHEL as per desired quality and delivery requirements.
- 3.2.2 Formulate a standard technical specification in discussions with selected applicants and subsequently seek formal techno-commercial proposal through a separate tender.
- 3.3 Applicants are expected to deliver following items/services:-
- 3.3.1 Supply of machined bogie frame wherein raw material, fabrication and machining all will be in scope of vendor.
- 3.3.2 Machining of bogie frame wherein fabricated bogie frame shall be provided by BHEL on free issue basis.
- 3.4 **Applicant can submit their application for both items- 3.3.1 & 3.3.2 or for any one of them.**
- 3.5 It is envisaged that the selected applicant shall fulfil the requirements as laid out in our preliminary specification no.- LME/PUR/352 (copy attached).
- 3.6 BHEL shall select applicant/applicants who meet the PQR as per clause 5 of this EOI.

4.0 INSTRUCTION TO APPLICANTS:

- 4.1 Reputed business entities (Applicant) may submit their application by furnishing following :-
- a) Information as per Annexure -1
- b) Duly filed Annexure - 2 (along with supporting documents for PQR)
- c) Clause wise comments on BHEL spec no.- LME/PUR/352

Above documents are to be submitted by Post / e-mail so as to reach us on or before **20th June 2023** at the following address:

Additional General Manager / LME & LFE
Locomotive Engineering Division,
Bharat Heavy Electricals Limited
Jhansi – 284120, Uttar Pradesh, India
Telephone: +91-510-2412686
Mobile: +91-9453001075
Fax: +91-510-2412114
Email: girish.raj@bhel.in

Note: Original signed copy shall be sent immediately so as to reach within 7 days of e-mail.



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- 4.2 The details submitted by the Applicant(s) shall be complete in all respects and BHEL may seek clarifications/additional information as considered necessary. Such clarifications/additional information must be provided within 2 days of BHEL request.
- 4.3 The EOI process involves seeking willingness of interested party/parties and selecting party/parties amongst all who make an application in response to this EOI.
- 4.4 Any request for further information or clarification on the EOI document may be submitted to above address.
- 4.5 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.
- 4.6 Duly authorized representative of the Applicant(s) shall sign on each page of the document. Response to EOI should be prepared in such a way so as to provide a straight forward, concise description of Applicant's capabilities.
- 4.7 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.
- 4.8 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.
- 4.9 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.
- 4.10 All costs incurred for participation in the EOI shall be borne by the Applicant (s).
- 4.11 Any request for further information or clarification on the EOI document may be submitted in writing to us. BHEL may respond to the queries raised/clarifications sought to the best of its ability. However, no extension of time or date for submission of response to EOI shall be given on the ground that BHEL has not responded to any query/clarification raised by any party.

5.0 Pre-Qualifying Criteria (PQR):

The applicant must meet the following pre-qualification requirement supported with relevant documents/ credentials/ certificates for further consideration:

- 5.1. The vendor shall have compliance to the EN 15085 meant for – “Railway applications, welding of railway vehicles and components. Inspection, testing and documentation”.
- 5.2. The vendor shall have following infrastructure facility at their works for manufacturing of bogie frame.
 - i. The vendor shall have suitable Machining center (minimum 5-axis CNC), with suitable bed size for machining of bogie frame. Machine should have 3-axis movement of X, Y, Z Axis & two rotational movements of milling head for drilling and facing.

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- ii. The firm shall have suitable CMM (Coordinate Measuring Machine) or shall arrange the same through third party for dimensional measurement of machined bogie frame.
- iii. The firm shall have robot for welding major straight welds of bogie side frames & transoms.
Note: Manual welding in place of robot welding is permitted provided,
- a) Welder qualification certification and auditing of welding facilities by suitable third party agency shall be carried out in accordance with relevant sections of EN 15085.
 - b) Increased frequency of testing of welder & revalidation of WPS to ensure consistency in quality of the welds shall be ensured in accordance with relevant sections of EN 15085.
 - c) QAP for manual welding and welding sequence shall be submitted before start of welding activity.
- iv. The vendor shall have high definition plasma or Laser profile cutting machine of suitable capacity.
- v. The vendor shall have CNC Press brake of suitable capacity with back gauging for accurate bending of bogie components.
- vi. The vendor shall have hydraulic press for straightening of components.
- vii. The vendor shall have shot blasting plant or equivalent facility for surface preparation in house.
- viii. The vendor shall have painting facility in house (closed chamber).
- ix. The vendor shall have suitable fixtures for welding of sub-assemblies of bogie, welding of bogie frame, welding of brackets / sub-assemblies with bogie frame.
- x. The vendor shall have suitable manipulator for down hand welding of bogie frame and components.
- xi. The vendor shall have suitable MAG welding set (400A or more) & suitable shielding media.
- xii. The vendor shall have furnace with temperature controllers for stress relieving of bogie frame complete.
- 5.3. Vendor should not have been blacklisted / banned for business dealings for Ministry of Railways or any Department of Government of India.
- 5.4. **Applicants who applying their application only for 3.3.2 (i.e. only machining of bogie frame) will be evaluated only for- 5.2 (i), 5.2 (ii) & 5.3.**



Information to be submitted by Applicant

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 Telephone nos. / Fax nos.:

Registered Office:

Head Office:

Address for communication:

Contact Details:

Office Address in India, if any:

7. Documents to be enclosed:
 - a) Duly filled Annexure-2 along with all applicable documents considered relevant to meet PQR.
 - b) Clause wise comments on BHEL spec no.- LME/PUR/352.

(Sign & Company Seal)

Authorized signatory

Annexure-2

Eligibility Criteria		Applicant's Response	
Technical Criteria		Meeting the criteria Yes / No	Documentary evidence: Enclosed / To be submitted later
1	The vendor shall have compliance to the EN 15085 meant for – “Railway applications, welding of railway vehicles and components. Inspection, testing and documentation”.		
2	The vendor shall have following infrastructure facility at their works for manufacturing of bogie frame.		
2.1	The vendor shall have suitable Machining center (minimum 5-axis CNC), with suitable bed size for machining of bogie frame. Machine should have 3-axis movement of X, Y, Z Axis & two rotational movements of milling head for drilling and facing		
2.2	Vendor shall have CMM or shall arrange the same through third party for dimensional measurement of machined bogie frame.		
2.3	The vendor shall have robot for welding major straight welds of bogie side frames & transoms.		
2.4	The vendor shall have high definition plasma or Laser profile cutting machine of suitable capacity.		
2.5	The vendor shall have CNC Press brake of suitable capacity with back gauging for accurate bending of bogie components		
2.6	The vendor shall have hydraulic press for straightening of components.		
2.7	The vendor shall have shot blasting plant or equivalent facility for surface preparation in house.		
2.8	The vendor shall have painting facility in house (closed chamber).		
2.9	The vendor shall have suitable fixtures for welding of sub-assemblies of bogie, welding of bogie frame, welding of brackets / sub-assemblies with bogie frame.		
2.10	The vendor shall have suitable manipulator for down hand welding of bogie frame and components.		
2.11	The vendor shall have suitable MAG welding set (400A or more) & suitable shielding media.		
2.12	The vendor shall have furnace with temperature controllers for stress relieving of bogie frame complete.		

(Sign & Company Seal)



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Other Criteria		Meeting the criteria Yes / No	Documentary evidence: Enclosed / To be submitted later
3	Vendor should not have been blacklisted / banned for business dealings for Ministry of Railways or any Department of Government of India.		
Additional financial information to be submitted by applicant			
4	Applicant to submit the financial statements of last three financial years indicating turnover, audited profit and loss statement along with supporting documents.		

Note:- Applicants who applying their application only for 3.3.2 (i.e. only machining of bogie frame) are required to provide information against point no.- 2.1, 2.2, 3 & 4 only.

(Sign & Company Seal)
Authorized signatory



LME:009C

LOCOMOTIVE ENGINEERING DEPTT.

PURCHASE SPECIFICATION

LME/ PUR/352

ISSUE DT: 23.05.23

REV.NO.: 00

REV. DT.:

SHEET 1 OF 6

SPECIFICATION FOR MANUFACTURE AND
SUPPLY OF MACHINED BOGIES FRAMES
FOR VANDE BHARAT TRAIN SET

Enclosures :

Rev.	Date	Prepared	Rev	Date	Prepared	Rev	Date	Prepared
		Approved			Approved			Approved
Rev	Date	Prepared	Rev	Date	Prepared	Rev	Date	Prepared
		Approved			Approved			Approved

Prepared by :

Checked by :

Approved by :

Distribution : Loco Prodn.
(001)

Loco PPC
(002)

Loco QC
(003)

Tech.
(004)

CQX
(005)



LME:012: B

LOCOMOTIVE ENGINEERING DEPTT.

CONTINUATION SHEET

LME/ PUR/352

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1. INTRODUCTION

1.1. Consortium of M/s BHEL and M/s Titagarh Rail Systems Limited (formerly called M/s Titagarh Wagons Limited) has been awarded an order for manufacturing, supplying and maintaining 80 Vande Bharat Trainsets. In this project, BHEL Jhansi is required to deliver fully assembled bogies for final coach assembly.

1.2. This specification covers the technical requirements to be complied by the vendor for manufacture and supply of machined bogie frames for Vande Bharat Trainset.

2. SCOPE

2.1. Scope of Supply :-

2.1.1. The scope of supply covers fabrication and machining of bogie frame.

OR/AND

2.1.2. Machining of fabricated bogie frame supplied by BHEL.

Vendors interested in both -2.1.1 & 2.1.2 or in any one of them can respond.

2.2. Variants of Bogie Frame:-

2.2.1. Following is the list of variants of Bogie Frames

- a) Bogie Frame for Motor Coach
- b) Bogie Frame for Trailer Coach

3. DRAWINGS AND DOCUMENTS

3.1. Manufacturing drawing/documents/specification shall be provided by BHEL after award of contract against NDA (Non-Disclosure Agreement).

3.2. Vendor shall ensure that all the latest drawings, documents and specifications are followed during the manufacturing of the bogies.

3.3. It is the responsibility of the vendor that drawings are utilized only for manufacturing of bogies for supply to BHEL, no exploitation or transfer of any information contained therein is permitted.

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4. REQUIREMENTS

4.1. The vendor shall submit clause wise comments on this specification. Vendor shall bring out the deviations, if any from the specification with adequate justification for such deviations. Unless otherwise stated in the offer it will be presumed that there are no deviations.

4.2. The vendor must have compliance to the EN 15085 meant for – “Railway applications, welding of railway vehicles and components. Inspection, testing and documentation”.

4.3. Infrastructure facility:

The vendor shall have following infrastructure facility at their works for manufacturing of bogie frame.

i. The vendor shall have suitable Machining center (minimum 5-axis CNC), with suitable bed size for machining of bogie frame. Machine should have 3-axis movement of X, Y, Z Axis & two rotational movements of milling head for drilling and facing.

ii. The firm shall have suitable CMM (Coordinate Measuring Machine) or shall arrange the same through third party for dimensional measurement of machined bogie frame.

iii. The vendor shall have robot for welding major straight welds of bogie side frames & transoms.

Note: Manual welding in place of robot welding is permitted provided,

a) Welder qualification certification and auditing of welding facilities by suitable third party agency shall be carried out in accordance with relevant sections of EN 15085.

b) Increased frequency of testing of welder & revalidation of WPS to ensure consistency in quality of the welds shall be ensured in accordance with relevant sections of EN 15085.

c) QAP for manual welding and welding sequence shall be submitted to BHEL before start of welding activity.

iv. The vendor shall have high definition plasma or Laser profile cutting machine of suitable capacity.

v. The vendor shall have CNC Press brake of suitable capacity with back gauging for accurate

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bending of bogie components.

- vi. The vendor shall have hydraulic press for straightening of components.
- vii. The vendor shall have shot blasting plant or equivalent facility for surface preparation in house.
- viii. The vendor shall have painting facility in house (closed chamber).
- ix. The vendor shall have suitable fixtures for welding of sub-assemblies of bogie, welding of bogie frame, welding of brackets / sub-assemblies with bogie frame.
- x. The vendor shall have suitable manipulator for down hand welding of bogie frame and components.
- xi. The vendor shall have suitable MAG welding set (400A or more) & suitable shielding media.
- xii. The vendor shall have furnace with temperature controllers for stress relieving of bogie frame complete.

4.4. Welding Inspection:

- 4.4.1. All butt joints of the bogie frame & sub assembly shall be subjected to radiographic examination to ensure weld quality either in house test facility or by out sourcing the testing.
- 4.4.2. Drawings shall indicate weld performance class and inspection class. Wherever inspection level of CP B & CP C2 are indicated in drawing, such weld joints shall be inspected and certified by qualified Inspectors. NDT personnel carrying out radio graphic examination, ultrasonic testing, magnetic particle examination & dye penetrate testing should also be qualified as per ISO 9712 Level-II.
- 4.4.3. After complete welding, all bogie frames shall be stress relieved in house before machining.
- 4.4.4. Only certified welder for precision & heavy fabrication shall be employed.

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5. SOURCING OF RAW MATERIAL AND BOUGHT OUT ITEMS

5.1. Vendor shall be required to procure the following critical bought out items/assemblies only from the sources as mentioned below:-

Items	Supplier (M/s)
Casting & Forging Items	Sarita Forging or from any other sources who have successfully supplied & commissioned same item in Vande Bharat Trainset/Train-18.

5.2. The chemical composition and mechanical properties of steel plates, castings, forgings to be used for bogie shall conform relevant standards as per relevant drawings.

5.3. All records of physical, chemical, impact tests of raw material shall be made available to the inspecting agency. All plates, forgings & castings to be taken up for manufacture shall be visually checked for surface defects such as cracks, dents, pitting, bend, rust, scales and they shall be free from all these defects. Straightening machine or Hydraulic press, Hammer shall not be used to straighten the plates.

5.4. Before actual manufacturing, vendor shall inform about the sources of different raw material/bought items that will be used and shall also furnish supporting documents regarding credentials of suggested sources. Vendor shall move ahead with manufacturing only after due approval of BHEL.

6. FREE ISSUE ITEMS

6.1. For scope of work mentioned at 2.1.2, only machining of bogie frame, the fabricated bogie frame shall be supplied by BHEL on free issue basis.

6.2. Vendor shall collect items listed at 6.1 from BHEL complying the BHEL terms & conditions like submission of BG against free issue items etc.

7. SHOT BLASTING

The bogie frame shall be subjected to shot blasting using shots to grade Sa2.5 of ISO-8501-1-1988 for cleaning of rust scales, spatters before painting of the Bogie frames.

8. PAINTING

Surface protection of all bogie components and assemblies shall be as per part-II of specification no. ICF/MD/Spec.299 with latest (revision and amendment). Copy of same can be downloaded

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from ICF's website.

9. QUALITY ASSURANCE PLAN

The vendor shall submit QAP to BHEL within 1 month of award of contract for BHEL's approval. QAP shall have suitable stage inspection points and shall have BHEL's witness points (CHP) wherever deemed necessary.

10. IDENTIFICATION MARKING

Each bogie frame shall be punched with an easily visible identification indicating the bogie frame serial number, month and year of manufacture and manufacturer's name to facilitate identification / correlation with the inspection/test results.

- 11.** In addition to this specification, vendor to also follow Indian Railways specification no.- ICF/MD/SPEC-391, in general, for fabrication and machining of bogie frames. In case of contradiction, conditions laid out in this specification shall prevail. Latest copy of Indian Railways specification can be downloaded from ICF's website.

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