



# Expression of Interest (EoI) for Technology Collaboration Agreement (TCA) for Signaling Systems for Railway/Metro

**Subject: Technology Collaboration for Signaling Systems for Railway/Metro**

## 1) Introduction:

This Expression of Interest (EoI) seeks response from Full-time UNISIG Members who are willing to be associated with BHEL through a license & technology collaboration agreement on long term basis, to enable BHEL to design, engineer, manufacture, assemble, quality control, test, supply, install, commission, repair, service and retrofit on-board and track-side equipment for Signaling and Train Control System ETCS L2/CBTC for Railways/Rail Transit Metros.

BHEL is a leading state-owned company, wherein Government of India is holding 63.17% of its equity. BHEL is an integrated power plant equipment manufacturer and one of the largest engineering and manufacturing organization in India, catering to the core infrastructure sectors of Indian economy viz. energy, transportation, heavy engineering industry, defense, renewable and non-conventional energy. The energy sector covers generation, transmission and distribution equipment for thermal, gas, hydro, nuclear and solar photo voltaic. BHEL has been in this business for more than 50 years and BHEL supplied equipment's account for more than 59% (approx. 190 GW) of the total thermal power generating capacity in India. BHEL is also listed in both major Indian stock exchanges. BHEL has 16 manufacturing units, 4 power sector regions, 8 service centre, 1 overseas office and 15 regional offices besides host of project sites spread all over India and abroad. The annual turnover of BHEL for the year 2019-20 was around USD 2.85 billion. BHEL's highly skilled and committed manpower of approx. 34000; state-of-the-art manufacturing facilities and latest technologies helped BHEL to deliver a consistent track record of performance since long. To position leading state-owned companies as Global Industrial giant and as a recognition for their exemplary performance, Government of India categorized BHEL as "Maharatna Company" in 2013.

Our ongoing technology tie-ups with leading technology providers are GE Technology GmbH, Switzerland (for Once through Boilers and Coal Pulverisers); Siemens, Germany (for Steam Turbines, Generators and Condensers); MHI, Japan (for Pumps); MHPS, Japan (for Flue Gas Desulfurization Systems); Vogt Power International, USA (for HRSG); OTO Melara, Italy (for SRGM); ISRO, India (for space grade li Ion cells); BPE, USA (for SCR System), NANO, Korea (for SCR Catalyst); HLB Power Co. Ltd., Korea (for Gates and Dampers) and Kawasaki Heavy Industries Ltd., Japan (for Stainless Steel Metro Coaches & Bogies).

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

## 2) BHEL's Credentials in Rail Business:

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 manufacturing of complete electric and diesel electric locomotives and electrical assemblies/components including traction motors, traction transformers, power & auxiliary converters and controls, gear wheels etc. BHEL is a regular supplier of propulsion equipment of ACEMU/MEMU.

At Jhansi Plant, BHEL is manufacturing complete Electric Locomotives upto 6000 HP rating for mainline application of Indian Railways, Diesel Electric Locomotives from 350 HP to 1400 HP rating. Till date, BHEL has supplied cumulatively more than 725 nos. of main line electric locomotives to Indian Railways and diesel electric locomotives for shunting operations to various industries.

BHEL's Jhansi plant has an installed capacity of 75 nos. locomotives per year. At Jhansi, BHEL has complete state-of-the-art facilities for manufacturing, fabrication and testing of bogies, loco shells, under frames and other mechanical components of locomotives. BHEL has recently developed India's first state-of-the-art WAG7 Electric Locomotive with regenerative capabilities. BHEL has also developed India's first Traction Motor for 9000HP Electric Locomotives.

Among electrical propulsion equipment, BHEL 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. BHEL's manufacturing range



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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. BHEL has full-fledged service department located at major centers in the country.

BHEL is establishing state-of-the-art design, engineering and manufacturing facility, which is presently under progress at BHEL, Bhopal Unit, to cater the requirements of Stainless-Steel Coaches for EMUs for urban transportation and Trainsets for semi high-speed Rail transportation.

BHEL's Electronics division (EDN) at Bengaluru is the nodal agency for electronics in BHEL & it provides a strong base in the areas of Automation and Power Electronics and to supplement the Company's pioneering efforts in the core sectors. Many of the power plants and industries in the country today are equipped with electronic products and systems that have been manufactured and supplied by BHEL EDN. EDN supplied equipment accounts for about 63 % of total Control & Instrumentation (C&I) equipment in the country and continue to be the leader in power industry for past several decades.

### 3) Scope of Cooperation

In order to meet upcoming market requirements for Signaling Systems for Railways/Metro in India and neighboring countries, BHEL intends to enter into a Technology Collaboration Agreement (TCA).

BHEL is seeking responses from Full-Time UNISIG Members of Signaling Systems of Railways/ Metros for technology transfer and collaboration on a long term basis to design, engineer, manufacture, assemble, test, supply, erect, commission, retrofit, repair and service on-board and trackside equipment for ETCS Level 2, CBTC Signaling and Train Control Systems for Railways/ Rail-Transit/Metros.

BHEL intends to manufacture and supply these Signaling Systems under a long-term licensing & technology transfer agreement which could be operationalized with transfer of technology. Interested parties/prospective collaborator meeting requirement of this Eoi are invited to respond to this Eoi.

Upon receipt of responses against Eoi from the Prospective Collaborator, BHEL will review the responses to ascertain suitability of the offer made by the Prospective Collaborators and shortlist the parties for further discussions. Detailed discussions on commercial and other terms and conditions to finalise the Technology Collaboration Agreement (TCA) shall be held with shortlisted parties/Prospective Collaborators. The detailed terms and conditions for such a paid-up license agreement shall be mutually agreed upon.

Indicative scope of technology transfer for Signaling Systems are given in [Annexure-1](#).

### 4) Prequalification requirements (PQR)-

The Prospective Collaborator (Applicant) shall meet the following conditions as on the last date of submission of this Eoi: (to be substantiated with documentary evidence)

4.1 The Prospective Collaborator (Applicant) should be an ETCS – Level 2 and is UNISIG Full member.

AND

4.2 The Prospective Collaborator (Applicant) should have executed "Works related to ETCS Level – 2 system of any passenger carrying railways in the world; the work should include Design, Supply, Test, Installation and Commissioning of On Board Equipment (OBE) or trackside equipment or both in last five years before the deadline of submission of responses as under:

4.2.1 Execution of ETCS Level – 2 work of value Indian Rupees = 6000 Millions

4.2.2 Execution of ETCS Level – 2 work of Route-KM = 224 KMs

AND

4.3 The Prospective Collaborator (Applicant) should have executed at least one single work of design, supply, installation, testing & commissioning of Signaling & Train-Control system using radio-based CBTC with moving block including CBI & ATP sub-system, on an MRTS line during last 10 years.

AND



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4.4 The Prospective Collaborator (Applicant) should also meet following financial parameters:

4.4.1 Net worth {to be obtained from balance sheet} should be positive at end of last Financial year.

4.4.2 Profitability {Earnings or Profit before tax but after interest} shall be positive in at least two financial years out of last five financial years.

Prospective Collaborator to provide relevant certificate(s)/ document to substantiate the PQRs.

## 5) Selection of Prospective Collaborator

Based on the information provided under this Eoi, the Prospective Collaborators (Applicant) shall be technically shortlisted on the basis of the requirement specified in PQR. Prospective Collaborators (Applicant) not meeting any of the parameters of evaluation criteria of this Eoi shall not be considered. The Prospective Collaborators (Applicant) who are qualified may be further evaluated on the basis of commercial proposals which shall be invited for the second stage of evaluation.

## 6) Brief Description of Eoi Process:

The interested parties shall ensure that their response, along with details requested as per the Annexures of this Eoi, is received by BHEL on or before **27<sup>th</sup> July 2020**. The response shall necessarily be accompanied with details on company background, technical features/ product catalogue, information on market share, copy of reference list, copy of annual audited financial reports for last 5 (five) years including copy of auditor's report etc. The responding parties, on submission of their response, can be called for further discussions to India at short notice.

The respondent shall submit their offer with all Annexures duly signed. In case any further information is needed, kindly feel free to contact us.

BHEL at its discretion may extend the due date for submission of Eoi and the decision of BHEL in this respect would be final & binding on the respondents.

In case any amendment/corrigendum issued to this Eoi, it shall be notified only at [www.bhel.com](http://www.bhel.com) .

## 7) Schedule of Eoi & contact details:

### 7.1 Schedule of Eoi:

The schedule of Eoi shall be as follows:

Sl. No.	Description	Date
1.	Issue of Eoi document	06.07.2020
2.	Last date for submission of Eoi response	27.07.2020

### 7.2 Contact Details:

The respondent shall submit their response with all annexures duly signed to the following official:

**Deputy General Manager (Technology Licensing)**

Corporate Technology Management

Bharat Heavy Electricals Limited

BHEL House, Siri Fort

New Delhi – 110049, India

Phone: +91 11 66337213 / 7339

Mobile: +91 9818103430/ +91 7838293011

Fax: +91 11 26492974

Email: [techeoi@bhel.in](mailto:techeoi@bhel.in)



**8) Miscellaneous:**

**8.1. Right to accept or reject any or all Applications:**

- a) Notwithstanding anything contained in this EoI, BHEL reserves the right to accept or reject any Application and to annul the EoI Process and reject all Applications, at any time without any liability or any obligation for such acceptance, rejection or annulment, and without assigning any reasons therefore. In the event that BHEL rejects or annuls all the Applications, it may, at its discretion, invite all eligible OEMs/Suppliers to submit fresh Applications.
- b) BHEL reserves the right to disqualify any Applicant during or after completion of EoI process, if it is found there was a material misrepresentation by any such Applicant or the Applicant fails to provide, within the specified time, supplemental information sought by BHEL.
- c) 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.

**8.2 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 the EoI process.

Indicative Scope of Technology Transfer

(a)	Licensing & transfer of state of the art technology relating to the design, engineer, manufacture, assemble, quality control, test, supply, install, commission, repair, service and retrofit state of the art on-board and trackside equipment for Signaling & Train Control System of ETCS Level 2/CBTC for Railway/Rail-Transit/Metro.
(b)	Assistance in planning & establishing the new manufacturing, testing and assembly facilities & processes/ suitable augmentation at BHEL's existing facilities/processes by way of expert advice in terms of identifying, sizing & selection of equipment / machinery required for manufacturing, their layout and foundation etc. Assistance for commissioning of the manufacturing facilities, design of special tools and dies, jigs & fixtures etc.
(c)	Transfer of applicable computer programs including Logics & Source Code (wherever applicable).
(d)	Prototype manufacture, integration and testing of Signaling Systems for Railways/Metros at BHEL Works as per specifications of Customers as well as providing assistance in according approvals of prototype from customers.
(e)	Transfer of improvements/modifications/developments/up gradations to be carried out by the Applicant during the period of TCA for taking care of new market requirements and obsolescence. Subsequent updates required due to component obsolescence or updates implemented by Applicant due to safety consideration would also be provided.
(f)	During the field trials and regular operation, if any modifications/updates are carried out to improve the performance/reliability of the system the same shall also be transferred to BHEL with complete know-how.
(g)	Training of BHEL engineers in the design, engineer, manufacture, assembly, quality control/quality assurance, testing, installation, commissioning, maintenance & operation of the Signaling Systems for Railways/Metros.
(h)	Deputation of Collaborator's experts to assist BHEL in absorbing the technology for licensed products.
(i)	Support through engineering services from Collaborator's design office / manufacturing facilities for licensed products.
(j)	Transfer of information to enable BHEL to source/procure those items, which Prospective Collaborator sources from other vendors (as these are not manufactured by the prospective Collaborator) for use in the Signaling Systems for Railways/Metros.

(SIGNATURE)

Collaborator's Experience in the field of Signaling Systems for Railways/Metros

Sl. No.	Requirement	Prospective Collaborator response YES/NO and remarks if any
(a)	Whether documentary evidence to substantiate the below PQRs has been submitted by Prospective Collaborator. "4.1 The Prospective Collaborator (Applicant) should be an ETCS – Level 2 and is UNISIG Full member."	
	"4.2 The Prospective Collaborator (Applicant) should have executed "Works related to ETCS Level – 2 system of any passenger carrying railways in the world; the work should include Design, Supply, Test, Installation and Commissioning of On Board Equipment (OBE) or trackside equipment or both in last five years before the deadline of submission of responses as under: 4.2.1 Execution of ETCS Level – 2 work of value Indian Rupees = 6000 Millions 4.2.2 Execution of ETCS Level – 2 work of Route-KM = 224 KMs"	
	"4.3 The Prospective Collaborator (Applicant) should have executed at least one single work of design, supply, installation, testing & commissioning of Signaling & Train-Control system using radio-based CBTC with moving block including CBI & ATP sub-system, on an MRTS line during last 10 years."	
	"4.4 The Prospective Collaborator (Applicant) should meet following financial parameters: 4.4.1 Net worth {to be obtained from balance sheet} should be positive at end of last Financial year. 4.4.2 Profitability {Earnings or Profit before tax but after interest} shall be positive in at least two financial years out of last five financial years."	
(b)	Whether Prospective Collaborator confirmed its willingness to facilitate BHEL in establishing required manufacturing facilities for Signaling Systems for Railways/Metros.	
(c)	Whether the Prospective Collaborator (Applicant) has been blacklisted / banned business dealings for Ministry of Railways or any Government Department of India.	
(d)	Whether any of the Prospective Collaborator's previous contract was terminated or part terminated due to bidder's failure.	
(e)	Whether Indian Railways have imposed delay damages of 5% or more of contractual value by REL on Prospective Collaborator.	
(f)	Whether the Prospective Collaborator suffered bankruptcy / insolvency in the last ten (10) years.	
(g)	Whether details of company background, product catalogues have been enclosed.	
(h)	Whether information on market share has been enclosed.	
(i)	Whether copy of Prospective Collaborator's detailed reference list has been enclosed.	
(j)	Whether copy of Prospective Collaborator's annual audited financial reports for last 5 years has been enclosed.	



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Sl. No.	Requirement	Prospective Collaborator response YES/NO and remarks if any
(k)	Whether a summary of experience & references have been enclosed.	
(l)	Whether the Prospective Collaborator owns the IPRs for the technology being proposed for transfer under the Technology Collaboration Agreement (TCA) or have unencumbered right from the owner of the IPRs to sub-license the technology, if applicable.  If yes, list of such IPRs to be enclosed.	
(m)	Whether the Prospective Collaborator confirmed the Transfer of essential technology to BHEL to enable BHEL to design, engineer, manufacture, assemble, quality control, test, supply, install, commission, repair, service and retrofit state of the art Signaling Systems for Railway/Metro.	

(SIGNATURE)



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**Annexure -3**

**Reference List:** The Prospective Collaborator shall furnish a summary of their product reference as detailed below for major supplies in last 10 years

Sr. No.	Year of Supply (Year 10 as the latest completed Calendar / Financial Year)	Description of Items	No. of Signaling Systems Contract	Name of Customer	Remarks
1	Year 10				
2	Year 9				
3	Year 8				
4	Year 7				
5	Year 6				
6	Year 5				
7	Year 4				
8	Year 3				
9	Year 2				
10	Year 1				
	Total				

**(SIGNATURE)**