Ref No: BHEL-Jhansi/RBMV/001

EXPRESSION OF INTEREST

FOR

Selection of vendor for

Hydrodynamic transmission (Torque converter) & Gearbox (for final axle drive) for Rail Borne Maintenance Vehicle (RBMV) having underslung diesel engine coupled with Hydrodynamic Transmission

&

3-year Annual Maintenance contract

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

(Here after referred to as 'BHEL')

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 Original Equipment Manufacturer (OEMs) meeting the eligibility criterion as defined in EOI and ready to associate with BHEL for the following two major components of RBMV machine:

i. Hydraulic transmission using hydro-dynamic elements and preferably provided with hydraulically reversible arrangement with anti-vibration mounting pads, mounting brackets & bolts, standstill detector & associated equipment's and controls as per Technical Specification- No. TM/HM/RBMV/422 Rev.01 of 2019.

ii. Axle drive gearbox of suitable gear ratio, complete with powered axle & torque arm assembly as per Technical Specification- No. TM/HM/RBMV/422 Rev.01 of 2019.

And

3 years Annual Maintenance contract (AMC) of Hydrodynamic transmission (Torque Converter) & Gear Box (for final axle drive) after the expiry of warranty period.

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 up to 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 725 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-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 up to 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.

We are establishing state-of-the-art design, engineering and manufacturing facility at BHEL, which is presently under progress at Bhopal Unit. The upcoming facilities shall be able to cater requirement of Stainless Steel Coaches for EMUs for urban transportation and Trainsets for semi high-speed Rail transportation.

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

3.0 PURPOSE

3.1 Indian Railways (IR) is the 4th largest railway network in the world with the track length of more than 1 Lakhs km. In order to have a proper and regular maintenance of the entire track, IR requires different types of track maintenance machines. IR have set an ambitious target for complete mechanization of track maintenance by the year FY 2024.

3.2 In order to meet the plan, 3-tier System of track maintenance shall be adopted on Indian Railways for mechanized maintenance as per Indian Railways Permanent Way Manual. In 3 tiers of track maintenance, one is Mobile Maintenance Units (MMU). The MMU shall be equipped with small track machines, tools & equipments used for day to-day track maintenance. To accommodate and transport these equipments and track workmen at worksite each MMU shall be provided with one self-propelled vehicle like Rail Borne Maintenance Vehicle (RBMV).

3.3 Ministry of Railways (Railway Board), New Delhi have floated an E-global tender No. TM 1922 for procurement of design, Manufacture, Supply, Testing and Commissioning of 430 nos. Rail Borne Maintenance Vehicle (RBMV) having underslung diesel engine coupled with Hydrodynamic Transmission.

3.4 RBMV shall be self-propelled diesel-powered, 8-wheeler bogie type, with bi-directional operation with diesel hydraulic drive. It shall be powered by two sets of power pack for rail traction application. Each set of power pack shall comprise an under slung diesel engine transmitting power through hydro dynamic transmission and cardan shaft(s) to the axle drive mounted on the inner axle of each bogie.

3.5 The intent of this Expression of Interest hereinafter referred to as the “EOI” is to invite applications from interested Party/Parties who are willing to Partner/Work Jointly with BHEL for hydraulic transmission and drive axle for participation in the Railway Board tender for Design, Manufacture, Supply, Testing, Commissioning of 430 nos. Rail Borne Maintenance Vehicle (RBMV). For reference and further details, complete tender document can be downloaded from IREPS website link given under

(https://www.ireps.gov.in/epsn/nitViewAnonyms/rfq/nitPublish.do?nitId=3078618&activity=viewNIT

3.6 The EOI process involves selection of interested party/parties who make an application in accordance with the provisions of this EOI (the "Applicant"). At the end of this process, BHEL expects to select Applicant(s) who shall be invited for further deliberations on requirements regarding supply, installation and commissioning of Hydrodynamic transmission (Torque Converter) & Gear Box (for final axle drive). In addition, the party is required to provide 3 years AMC of Hydrodynamic transmission (Torque Converter) & Gear Box (for final axle drive) after expiry of warranty period.

3.7 BHEL shall select party/parties who meet the PQR as per clause 5 of this EOI.

4.0 INSTRUCTION TO APPLICANTS:

4.1 ***Reputed business entities may submit their application as per Annexure -1*** (along with supporting documents for PQR) by Post/e-mail/hand in 2 copies (Original+1) so as to reach us on or before 10th March' 2020 at the following address:

Sr.Dy. General Manager / LME
Locomotive Engineering Division,
Bharat Heavy Electricals Limited
Jhansi – 284120, Uttar Pradesh, India
Telephone: +91-510-2412609, 2412686
Mobile: +91-9453001075
Fax: +91-510-2412114
Email: kd_manjhi@bhel.in, girish.raj@bhel.in

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

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 *within 07 days from date of issue of EOI*.

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 prospective party/ respondent must meet the pre-qualification requirement as applicable and tabulated below, supported with relevant documents/ credentials/ certificates for further consideration:

Technical Criteria	
Design, Manufacturing and Supply capabilities	
A.	The vendor should be regular manufacturer of either Hydrodynamic transmission or Gearbox and have supplied such systems for railway application (locomotive/track machines such as RBMV/UTV/Tower wagon etc.) to Indian Railways or in at least two countries national/main line passenger carrying public railway transportation systems (Govt/Private/Metro) in addition to their country of incorporation. They must have adequate technical knowledge and practical experience in supplying the equipment's. Applicant to submit documentary evidence along with EOI response.
B.	Equipment supplied by applicant must be working satisfactorily and in successful operation for at least 2 years till the date of issue of EOI. Applicant to submit documentary evidence.

6.0 Technical description of Hydrodynamic transmission (Torque Converter) & Gear Box (for final axle drive)

1. The power shift transmission shall be hydrodynamic so that there is no wear and tear in field operation. The tenderer shall give the full technical data of the power transmission system.
2. The power pack and transmission equipment shall be mounted on the under frame so that whole assembly occupies as little space over floor as possible.
3. Transmission shall be either step less or minimum 3 steps bi-directional with maximum speed possible in both forward as well as in reverse direction.
4. The transmission shall provide smooth shifting at full power while shifting to higher or lower steps.
5. The combined performance of the twin power equipment shall not be inferior to the tractive effort curve placed at Annexure–A.
6. Transmission shall have provision of secondary lubrication arrangement to provide protection to transmission from damage during towing in train formation.
7. Transmission shall be coupled with underslung diesel engine of rating 400hp@2100rpm. Diesel engine shall be of Cummins or equivalent make.
8. The auxiliary loads driven by Diesel engine shall be of about 150 hp (approx.). Thus, suitable transmission meeting these power requirements to be offered.
9. The tentative layout of RBMV machine shall be as per the sketch in Annexure –B.
10. The maximum permissible axle load for the RBMV machine is 20.3 tonne. So, RBMV machine weight shall be kept within the limit of 80 tonne including 15 tonne payload.
11. The maximum speed of the RBMV machine (self-propelled travel mode without trailing load) shall be 100kmph. The machine shall be tested during trial by Inspection agency (RDSO) at the speed of 110 kmph (10% higher than rated speed).So, Transmission & Gearbox to be offered for RBMV machine must be capable to reach the required speed with the wheel diameter of 952 mm (New).

For detail please refer to attached Railway board tender spec - No. TM/HM/RBMV/422 Rev.01 of 2019

7.0 Additional information:

A.	Annual Maintenance Contract (AMC)
i.	The applicant shall be responsible for AMC of all items/Components of Hydrodynamic transmission (Torque Converter) & Gear Box (for final axle drive). All materials/spares/consumables and labour requirement shall be arranged by successful applicant during the course of AMC. The Annual Maintenance shall be for 3 years after expiry of warranty period. The vendor should quote servicing and break down maintenance charges (8 hours per day); including lodging and boarding for the service engineer, during post warranty 3 years AMC and separately quote the conveyance charges (in km basis) for journey on deputation performed by the service engineer, during AMC period.
B.	Warranty:-
i.	Warranty period of transmission & gearbox shall be same as defined for RBMV machine mentioned in the IR tender. RBMV machine shall be warranted for 2000 effective working hours or 24 months from the date of commissioning and proving test of machine at ultimate destination in India whichever shall be earlier. Effective working hours for this purpose will be traffic block time during which RBMV is deployed for work. Should any design modification be made in any part of the machine offered, the warranty period of 24 months would commence from the date of commissioning and proving test of the RBMV for the purpose of that part and those parts which may get damaged due to defects in the new replaced part. The cost of such modification shall be borne by the supplier. Item-wise list of spares per machine during warranty period shall be offered excluding all types of consumables. During warranty period, scheduled maintenance of Components shall be done by the successful contractor for which no extra cost shall be paid by BHEL/Indian Railways. Applicants are required to stocks adequate stocks of spares and service engineers of the Hydrodynamic transmission (Torque Converter) & Gear Box (for final axle drive) in India to attend the machine during warranty and beyond warranty up to a minimum of 20 years of commissioning of the machines or up to the completion of codal life of the machines as defined in the Indian Railway guidelines whichever is higher.

Annexure-1

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:

   Filled up Annexure -2 along with all applicable documents considered relevant to meet PQR and support evaluation criteria indicated in Applicant's response column of Annexure 2.

(Sign & Company Seal)

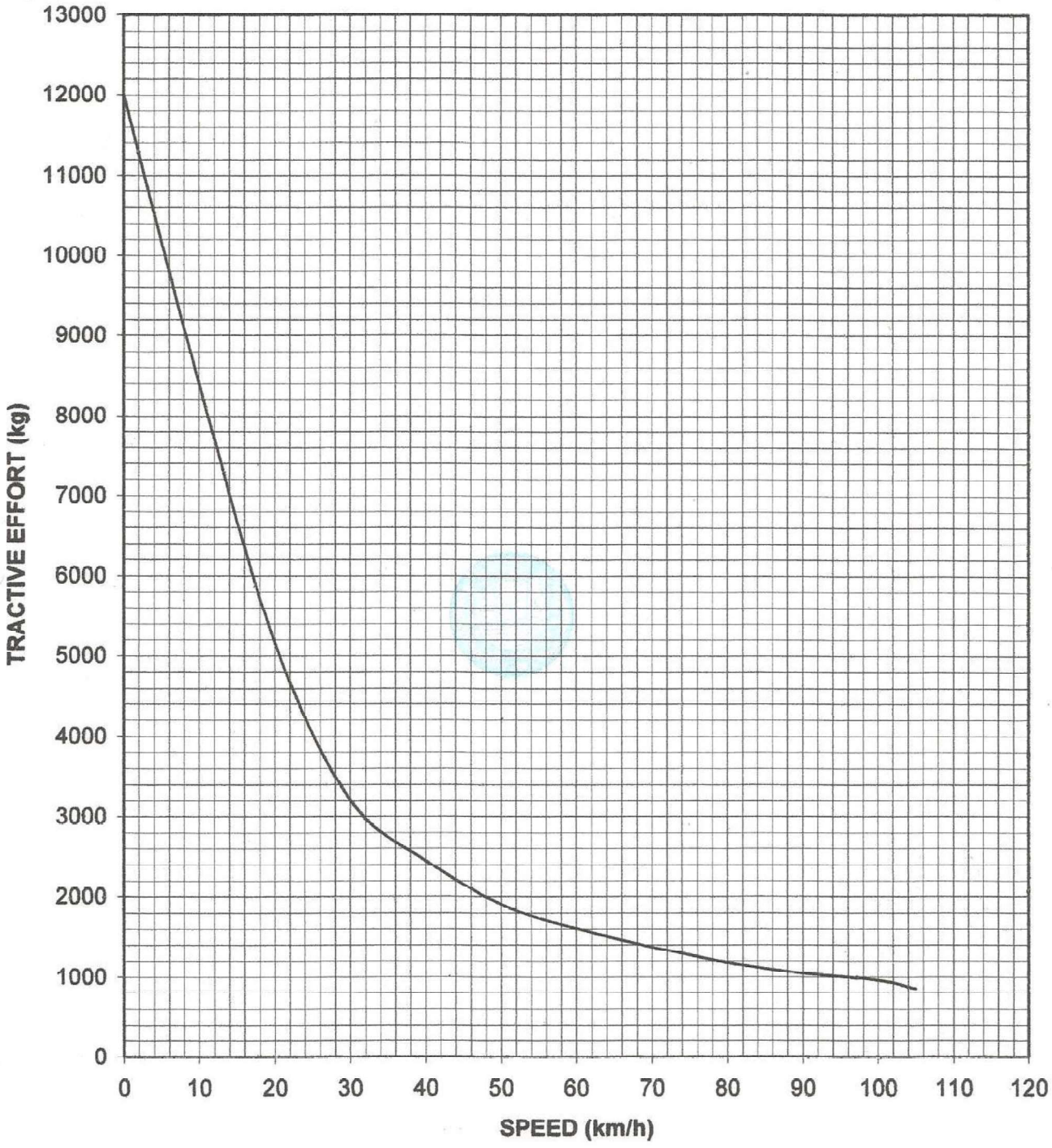
Authorized signatory

Annexure-2

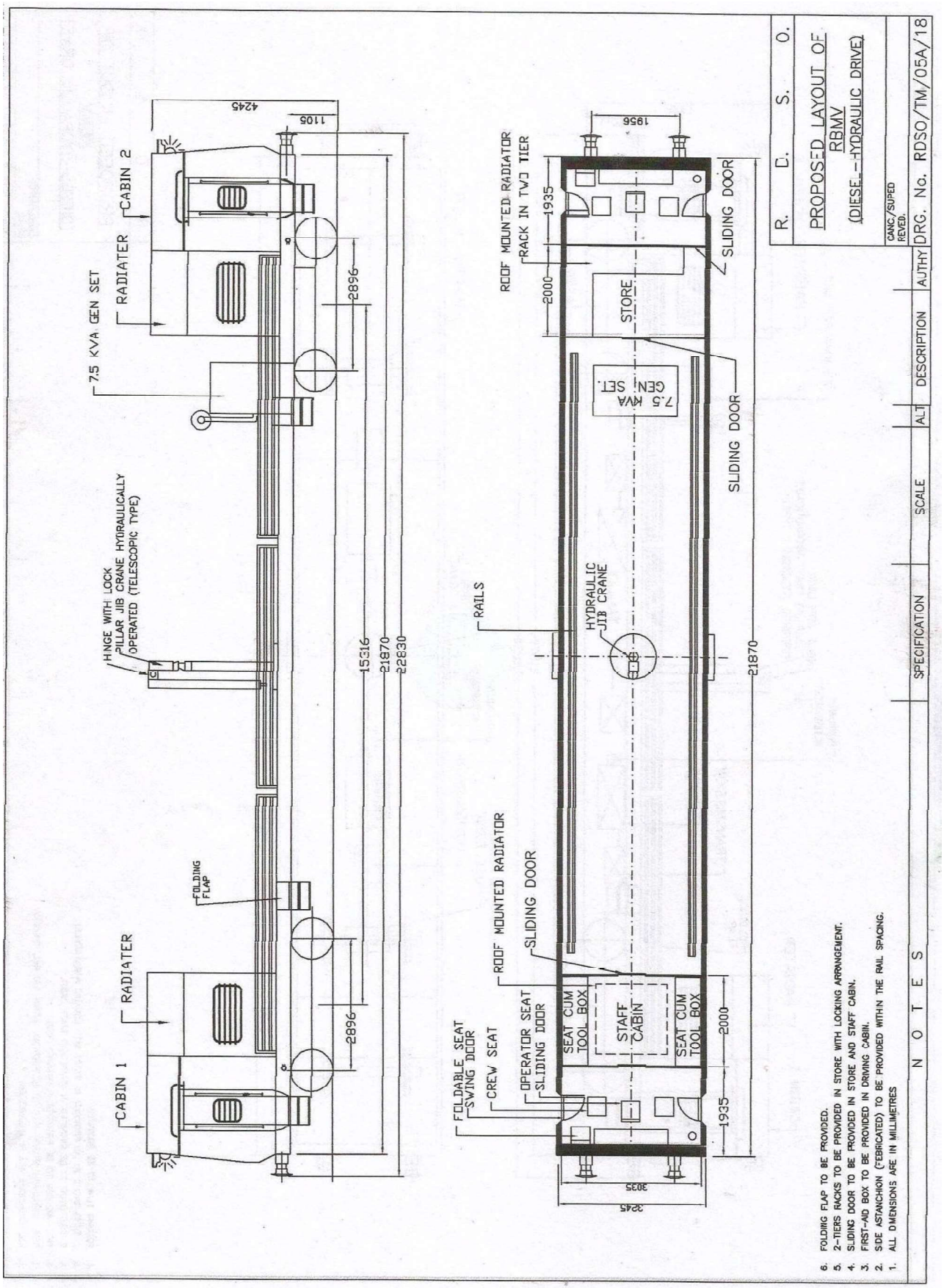
Eligibility Criteria		***Applicant's Response***	
Technical Criteria		***Meeting the criteria*** *Yes / No*	***Documentary evidence:*** *Enclosed / To be submitted later*
Design, Manufacturing and Supply capabilities			
A.	The vendor should be regular manufacturer of either Hydrodynamic transmission or Gearbox and have supplied such systems for railway application (locomotive/track machines such as RBMV/UTV/Tower wagon etc.) to Indian Railways or in at least two countries national/main line passenger carrying public railway transportation systems (Govt/Private/Metro) in addition to their country of incorporation. Applicant to submit documentary evidence along with EOI response.		
B.	Equipment supplied by applicant must be working satisfactorily and in successful operation for at least 2 years till the date of issue of EOI. Applicant to submit documentary evidence.		
Additional financial information to be submitted by applicant			
A.	Applicant to submit the financial statement of last 3 years indicating Turnover, audited profit and loss statement alongwith supporting documents.		

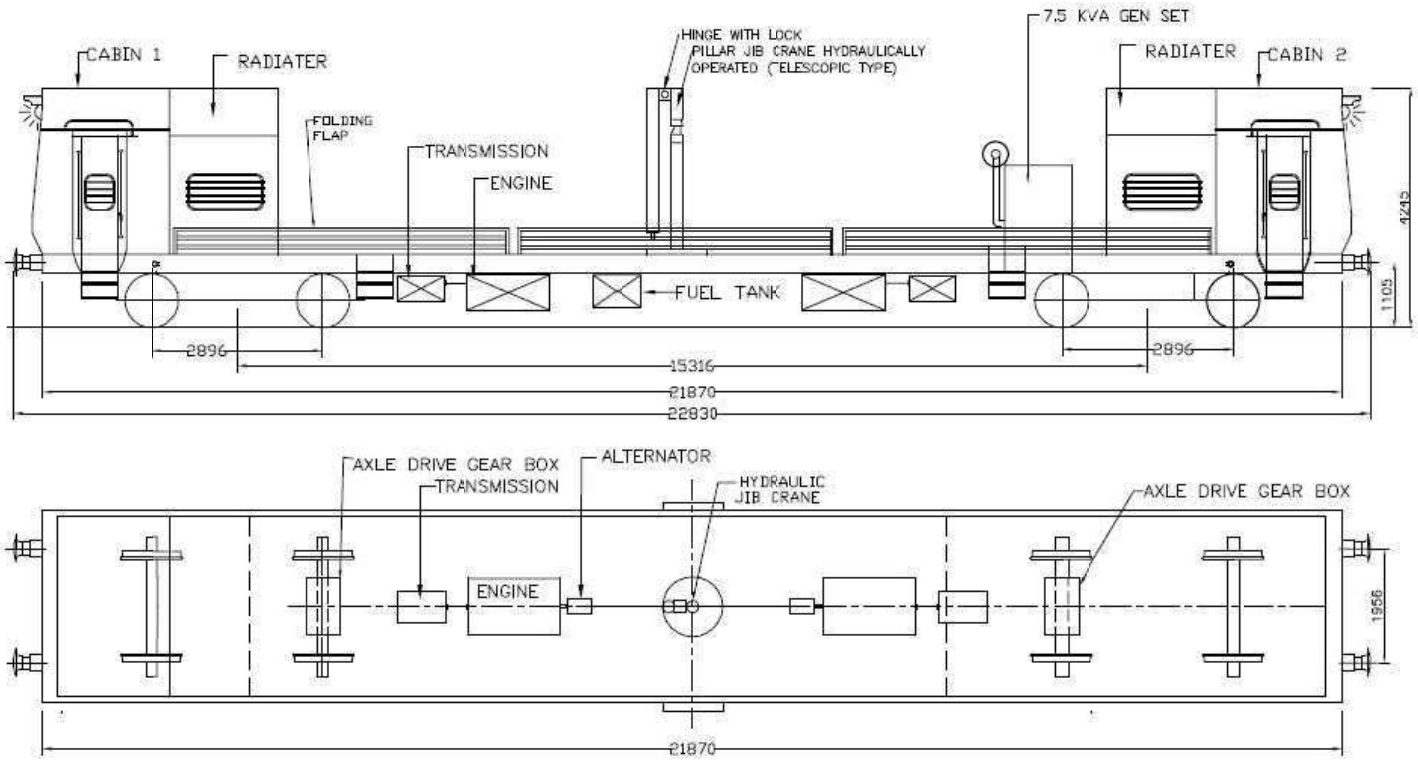
ANNEXURE-A

TRACTIVE EFFORT Vs SPEED CURVE FOR RAIL BORNE MAINTENANCE VEHICLE (RBMV)



ANNEXURE-B


R. D. S. O.
PROPOSED LAYOUT OF RBMV
(DIESEL-HYDRAULIC DRIVE)
CANC./SUPED REVED.
DRG. No. RDSO/TM/05A/18
SPECIFICATION
SCALE
ALT
DESCRIPTION
AUTHY
NOTES
1. ALL DIMENSIONS ARE IN MILLIMETRES
2. SIDE ASTANCHION (FABRICATED) TO BE PROVIDED WITHIN THE RAIL SPACING.
3. FIRST-AID BOX TO BE PROVIDED IN DRIVING CABIN.
4. SLIDING DOOR TO BE PROVIDED IN STORE AND STAFF CABIN.
5. 2-TIERS RACKS TO BE PROVIDED IN STORE WITH LOCKING ARRANGEMENT.
6. FOLDING FLAP TO BE PROVIDED.
CABIN 1
CABIN 2
RADIATER
RADIATER
7.5 KVA GEN SET
HINGE WITH LOCK PILLAR JIB CRANE HYDRAULICALLY OPERATED (TELESCOPIC TYPE)
FOLDING FLAP
ROOF MOUNTED RADIATOR
RACK IN TWO TIER
SLIDING DOOR
SLIDING DOOR
STORE
7.5 KVA GEN SET
RAILS
HYDRAULIC JIB CRANE
ROOF MOUNTED RADIATOR
FOLDABLE SEAT SWING DOOR
CREW SEAT
OPERATOR SEAT SLIDING DOOR
SEAT CUM TOOL BOX
STAFF CABIN
SEAT CUM TOOL BOX
4245
1105
2896
15316
21870
22830
2896
1956
1935
2000
21870
2000
1935
3035
4245



6. FOLDING FLAP TO BE PROVIDED.
5. 2-TIERS RACKS TO BE PROVIDED IN STORE WITH LOCKING ARRANGEMENT.
4. SLIDING DOOR TO BE PROVIDED IN STORE AND STAFF CABIN.
3. FIRST-AID BOX TO BE PROVIDED IN DRIVING CABIN.
2. SIDE ASTANCHION (FEBRICATED) TO BE PROVIDED WITHIN THE RAIL SPACING.
1. ALL DIMENSIONS ARE IN MILLIMETRES

NOTES	SPECIFICATION	SCALE	ALT	DESCRIPTION	AUTHY

R. D. S. O.

PROPOSED LAYOUT OF RAIL BORNE MAINTENANCE VEHICLE(RBMV) (DIESEL-HYDRAULIC DRIVE)

CANC./SUPED
REVED.

DRG. No. RDSO/TM/05B/18