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General: The purchase specification pertains to the procurement of RBMV material kits in Semi knocked-down (SKD) condition, along with comprehensive design and engineering support for the RBMV Project.

The specification is structured into two parts:

Part A: Covers supply of material kits in SKD condition, including their integration, assembly, and final testing at BHEL Jhansi premises as well as at site.

Part B: Encompasses design and engineering support for the RBMV Project.

The bidder shall be responsible for developing the complete machine design in accordance with Indian Railways (IR) technical specifications. The design must be cost-effective, optimized, and aligned with the contract value, ensuring that the machine can be manufactured within the awarded price.

It is essential that the bidder demonstrates that the proposed design is technically viable and cost-optimized. The vendor shall also ensure supply of the machine in semi knocked-down (SKD) condition as per the project requirements.


Further, the vendor is expected to possess adequate manufacturing facilities for producing major sub-assemblies, such as the underframe, bogie frame, carrying out sub-assemblies of items at its works so that these can be supplied in Semi Knocked down condition.

The vendor must also hold requisite quality and welding certifications, including ISO 9001 and EN 15085, to meet the stipulated manufacturing and quality requirements.

In case the bidder is engaged primarily in design activities and does not possess in-house manufacturing facilities, they may collaborate with other vendors having the necessary manufacturing capabilities to fulfill the requirements of the contract & requirement mentioned in *main IR specification TM/HM/RBMV/422 Rev.03 of 2024 & its amendments.*

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बी.एस.एल. जहानपुर, उत्तर प्रदेश


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TERMINOLOGY/ ABBREVIATIONS USED: -

- a. **"Bidder"** means the person/company/consortium/joint venture etc. submitting a bid.
- b. **"Contractor"** means successful bidder to whom tender will be awarded. At some places the term -"Design Partner/Vendor" shall be used in place of "Contractor". Both the terms shall mean same thing.
- c. **"RBMV"** means Rail Borne Maintenance Vehicle
- d. **"IR"** means Indian Railways.
- e. **"BHEL"** means Bharat Heavy Electricals Limited
- f. **"Project"** means all activities undertaken during execution of contract placed by IR on BHEL against the mentioned RBMV tender.
- g. **"Contract"** means Purchase Order/Work Order placed by BHEL on contractor.
- h. **"Party"**- BHEL and Design partner shall collectively be referred to as "Parties" and individually as "Party"
- i. **"SKD"** means Semi-Knocked- Down Condition.
- j. **"Main IR Specification"** corresponds to RDSO Specification -**TM/HM/RBMV/422 Rev.03 of 2024 & its amendments.**
- k. **"RDSO"** means Research Designs and Standards Organization, Lucknow, UP.
- l. **"IPR"** means **Intellectual Property Rights**

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बी.एच.ई. लि. इलाहाबाद




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- **Structure Assemblies:** Underframe Cabin structure, Equipment Mounting Brackets, structural support assemblies etc.
- **Bogie Assemblies (front & rear)** – Wheelsets, primary/secondary suspension, brake rigging (K-type non-asbestos blocks), axle-boxes, roller bearings. Preferably, a proven IR bogie may be used.
- **Prime mover (twin under-slung diesel engines)** – Mounting on anti-vibration pads, flywheel coupling, exhaust routing, radiator/fan assembly, alternators, fuel tanks, ECM integration.
- **Transmission System** – Hydrodynamic transmission, cardan shafts (angularity $\leq 5^\circ$), secondary lubrication arrangement, control items etc.
- **Hydraulic System** – Complete Hydraulic system including hydraulic powerpack, crane (knuckle/pillar-jib with outriggers), swiveling inspection platform, all cylinders, pumps, motors, valves, tanks, and load-sensing controls. Hydraulic hoses & fittings, hydraulic piping & assemblies etc.
- **Pneumatic System** – Twin-pipe graduated release air brakes, compressor (350 lpm FAD), air dryer, parking brake, emergency brake valves, D-1 valves.
- **Cabin Assembly** – Driver cabins (both ends), 12-person seating, tool boxes, operator seats (swiveling/folding), speed recorder, VCD, fire/smoke detection, CCTV, first-aid box.
- **Electrical Equipment** – Control panels, sensor & switches, electrical protection devices, Complete wiring harness (e-beam cables), head lights, flood lights, marker lights, flasher lights, horns, hooters, search lights, battery system, battery management, DC-DC converter, Air -Conditioning unit. etc.


3.0 Scope of Work: Integration and Assembly

The vendor/integrator shall execute the following activities:

- **Sub-Assembly Fitment:** Assembly and fitment of all major sub-assemblies such as frame, bogies, prime mover, transmission system, hydraulic system, pneumatic system, cabin assembly, and electrical equipment to manufacture the complete vehicle.
- **System Interfacing:** Complete integration of mechanical, hydraulic, pneumatic, and electrical systems, ensuring proper interfacing and functionality as per approved drawings and technical specifications.
- **Routing and Termination:** Routing, clamping, and termination of hydraulic pipelines, pneumatic circuits, and electrical wiring/harnessing. This includes installing a clutch system to disengage all hydraulic pumps in case of bursting of hydraulic hoses and utilizing e-beam cables for all electrical wiring.

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B.H.E.L., JHANSI

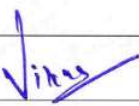
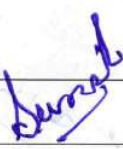
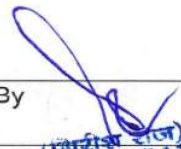
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- **System Calibration:** Alignment, calibration, and synchronization of all systems and sub-systems.
- **Fabrication and Welding:** All welding during the manufacturing of the machine shall conform to ISO: 3834, EN: 15085, or any other equivalent standard for welding railways vehicles and components.
- **Clearance Validation:** Ensure adequate clearance is allowed so that no component/part infringes the minimum vertical clearance of 91 mm from rail level while travelling on track up to condemnation limit of wheel.
- **Weight Distribution:** Ensure the lay outing of Equipment in such a manner to have equal axle loads, keeping the individual axle load less than 22.82 tonnes.
- **Mandatory Modifications:** Should any modification or further detailing be found necessary as a result of the design review by RDSO, or during pre-commissioning and acceptance tests, the same shall be incorporated and carried out by the vendor at their own expense. Modified drawings/documents shall be provided by vendor free of cost.
- **Facilities for Integration & Assembly of Vehicle:** BHEL shall provide the necessary infrastructure & facilities at BHEL works for carrying the integration & assembly of the vehicle. BHEL shall also arrange Diesel (HSD) required for testing of the Vehicle.


4.0 QUALITY ASSURANCE

4.1 The Contractor shall be responsible for preparation, submission, and compliance with the following quality documents, reports, and testing requirements:

- Preparation and submission of a Quality Assurance Plan (QAP) covering all requisite details, including stage-wise quality hold points, internal quality checks, and provisions for customer inspection/witnessing, wherever specified.
- Maintenance and submission of all relevant test records, calibration certificates, Non-Destructive Testing (NDT) reports, and torque tightening logs.
- Submission of final "As-Built" drawings, clause-by-clause compliance report, Manufacturer's Test Certificate, Squeeze Load Test Report, and internal quality assurance reports.
- Conduct the squeeze load test on proto-type frame & submit the Squeeze Load Test Report.
- Conduct of dimensional inspection for all assemblies to ensure conformity with approved drawings and specifications.
- Completion of functional testing of all systems prior to dispatch to verify performance and operational readiness.
- Ensuring full compliance with all applicable standards, specifications, and contractual requirements.

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5.0 Tools for Machine & engines, Instruction Manual, Drawings and catalogue:

A complete set of tools required for minor maintenance and repairs at Site, copies of the instructions and maintenance manual for the operation and maintenance of the machine as well as drawings and catalogue of the spare parts, to be supplied each machine, free of cost to the purchaser *as per clause- 16 of main IR Specification.*

The contractor shall prepare and submit:

- Operation Manuals
- Maintenance Manuals
- Troubleshooting Manuals
- Overhaul instructions

The manuals shall also include documentation for all Bought-Out Items (BOIs).

Additionally, illustrated parts catalogues shall be prepared, including:

- Part numbers
- Detailed descriptions
- Interchangeability details
- Recommended spare parts

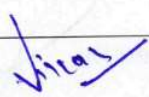

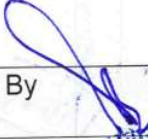
6.0 Packing & Transportation

- Proper packing of all assemblies
- Transportation and delivery to BHEL premises
- Supply of packing list and dispatch documentation


7.0 Inspection, Testing, and Acceptance as per IR Specifications

7.1 The inspection of the material kit shall be carried out at the Vendor's works by the BHEL inspection agency prior to dispatch, to ensure that all sub-assemblies/items conform to the requisite standards and specifications. *If required, the Indian Railways (IR) inspecting authority may also visit the vendor works for inspection of the supplies.*

7.2 Upon receipt of the complete material kit at BHEL Jhansi, the Contractor shall undertake integration and assembly of all components to make the machine ready for pre-dispatch inspection by IR representative.

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आपका कार्यालय, बी.एल. जहानपुर

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The Contractor shall carry out the following activities in line with applicable Indian Railways (IR) specifications after assembly of the machine, both prior to dispatch and at site (IR Shed). *Necessary assistance shall be provided by BHEL.*

Prior to dispatch from the assembly works, the fully integrated RBMV shall undergo comprehensive inspection and rigorous testing to ensure compliance as per **Clause- 21 of main IR specification** & to the satisfaction of IR Inspection agency:

7.3 Site Acceptance Tests (SAT)

The Contractor shall conduct Site Acceptance Tests at the ultimate consignee location as per **Clause -24** of the main IR Specification.

7.4 Oscillation Trials

The Contractor shall provide necessary support for conducting oscillation trials to obtain the final speed certificate, as per Annexure-IX of main IR Specification / EN 14363.

7.5 Compliance Testing

All testing shall be carried out strictly in accordance with applicable specifications and approved procedures.

7.6 Rectification of Defects

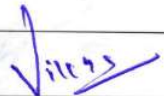


The Contractor shall promptly rectify all observations, deficiencies, or defects identified during inspection and testing free of cost.

7.7 Final Commissioning


The Contractor shall undertake final commissioning of the machine at site, ensuring readiness for operational use. The vendor will arrange to commission the machine within 90 days of its arrival at the ultimate consignee premises and will also arrange for tests to be conducted according to the contract as required.

7.8 Final Demonstration and Acceptance

The contractor has to demonstrate RBMV Vehicle for full compliance with all technical and functional requirements prior to final acceptance. The RBMV shall be accepted only after (vendor has to ensure):

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 Addl. General Manager (TNE, TAP & TNE)

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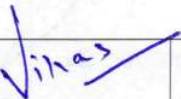
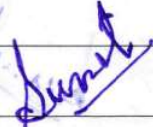
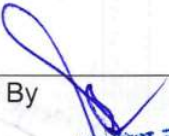
- Successful completion of all functional and performance tests.
- Zero infringement of IRSOD-2022 MMD.
- Full compliance with every clause of RDSO Main Specification.
- Issuance of pre-dispatch inspection certificate by RDSO/Inspecting Officer.

8.0 Training & service engineer:


The Contractor shall provide comprehensive training to BHEL and Indian Railways (IR) personnel in the operation, repair and maintenance of the RBMV. The training requirement of IR personnel shall be as below:

- Four IR personnel shall be given training for a period of two weeks in the manufacturing plant (BHEL Jhansi)/ field operation abroad where these machines are already in operation. Contractor has to support in providing the training.
- Adequate training for one month of four personnel of the Indian Railway for each machine should be arranged in India on the bidder's premises (at BHEL Jhansi)/ or at the site of commissioning of machines, in the operation, repair and maintenance of these machines at no extra cost. This training of the staff to be deployed on the machine, in operation repair and maintenance shall be completed before the commissioning of the machine. Contractor to support BHEL for the same.
- The contractor shall provide at his own expense the service of competent engineers for two weeks per machine in India for satisfactory commissioning & operation of the machines. During the warranty period for warranty related issues. The service engineers shall be available for the commissioning of the RBMV for regular service. E-Learning Courses shall be arranged by contractor for imparting training to Railways operators.

In addition, the above service engineer shall provide hands on training to Railways staff in calibration, operation, repairing and maintenance of the RBMV in field to make them fully conversant with the RBMV. The engineers shall also advise the Railways on appropriate maintenance, testing, operating, repair and staff training facilities that are necessary for the efficient performance of the vehicle.

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अपर महाप्रबन्धक (वि.एन.एच., सी.एच.के. एवं सी.एच.एच.ई.)
Addl. General Manager (TAM, TMS & TNE)
बी.एच.ई.एल. जहान्सी

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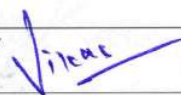

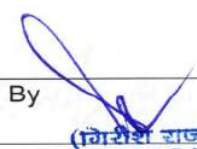
9.0 Warranty and AMC Support:


The warranty would commence post acceptance of RBMV by IR.

The RBMV shall be warranted for 2000 effective working hours or 18 months from the date of commissioning and proving test of machine or 24 months from date of delivery 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. Warranty period of 18/24 months shall be extended for the period of idling or breakdown (during warranty period) on vendor account. The warranty of machine also includes the warranty of engine(s).

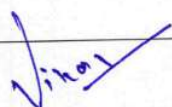

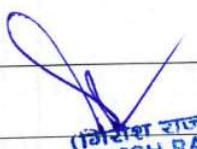
Should any design/failure modification be made in any part of the machine offered, the warranty period of 18 months would commence from the date of commissioning and proving test of the RBMV for the purpose of that part and those parts which may get damaged due to defects in the new replaced part. The cost of such modification shall be borne by the vendor.

AMC of Vehicle shall be dealt separately but vendor to ensure that they will have to support during the AMC.

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- litigation that may arise there from.
20. *Any entity who has secured order for supply of Rail Borne Maintenance Vehicle against the same tender of Railway Board TM-2303 for which this NIT has been called, such entity shall not be eligible to participate in this NIT and their response shall not be considered.*
 21. The successful bidder cannot enter into another agreement/MOU with other party for the design, manufacture, or supply of the RBMV during the period of the contract.

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