

Reasoned Document bases on comments received from various Firms, Railway Board and concerned Directorates of RDSO on Draft Technical specification No. TI/SPEC/OHE/NETRA /0140, Rev-2 (...2019) for Self propelled OHE Recording cum test Car (NETRA).

S. No.	Clause No. of Spec.	Description (as per Draft Spec.)	Firm's/ Railway Name	Firm's/ Railway comment	View of TI Directorate, RDSO	To be amended based on comments
1.	1.16	<p><b><u>SPECIAL TOOLS FOR MAINTENANCE</u></b></p> <p>The Bidder will also submit the list of special jigs, tools and instruments which shall be essentially required for maintenance of mechanical, electrical / electronics and pneumatic equipments at the design approval stage. The Bidder shall explain the purpose/justification of the specialized equipment so offered.</p>	Railway Board	Whether only list of special jigs, tools and instruments is required or it has to be supplied. Accordingly whether to ask for price bid of these items or not.	Accepted, List of tools specified in annexure-XII. Clause modified accordingly	<p><b><u>SPECIAL TOOLS FOR MAINTENANCE:</u></b></p> <p>List of tools &amp; special tools listed in Annexure-XII shall be supplied by Tenderer in a tool kit required by driver in an emergency and normal working of NETRA Car.</p>
2.	1.17	<p><b><u>TESTING KIT</u></b></p> <p>The contractor shall indicate testing equipment required for ensuring optimum performance and trouble free service of the car as well as their major assemblies and sub-assemblies. The tenderer with complete quotations shall submit details of testing kit/equipments at the time of offer.</p>	Railway Board	Comprehensive warranty for 24/30 months & comprehensive AMC for 10 years for measuring system is proposed-Do we need list of special tools for maintenance. Testing kit & spare parts.	Accepted, List of testing equipments specified in annexure-XIII and Clause modified accordingly.	<p><b><u>TESTING KIT:</u></b></p> <p>The tenderer shall supply testing equipment as per annexure-XIII with NETRA car required for ensuring optimum performance and trouble-free service of the major equipments &amp; accessories provided in the NETRA car (e.g. Diesel Engine, Traction Alternator, Traction Motor and other Equipments with accessories).</p>

3.	1.18	<p>The tenderer shall submit a list of spare parts both indigenous and imported, indicating the name and address of the manufacturers as detailed below:</p> <p><b>List-A:</b> Catalogue of unit spares, indigenous and imported, of the principal assemblies of the Car such as the diesel engine, transmission, compressor, measuring equipment etc. with price.</p> <p><b>List-B:</b> Recommended maintenance spares for two years initial requirements. The tenderer shall submit the list of such spare parts giving their detail description, specification, source of supply, part number of the supplier, service life and price of each part.</p>	Railway Board	This may also be reconciled with chapter-8, clause 8.1 to 8.3	Accepted and Paragraph re drafted	The tenderer shall submit a list of spare parts with catalogue, both indigenous and imported, indicating the name and address of the manufacturers, for principal assemblies of the Car such as the diesel engine, transmission, compressor etc.
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4.	1.23	<p><b><u>ANNUAL MAINTENANCE CONTRACT (AMC)</u></b></p> <p>1.23.1 The Supplier shall quote for AMC of all Equipment/Components of Measuring System such as Transducers, Load Cells, Strain Gauges, High Resolution Camera, On Board Computers, Laser Printers and Plotters, UPS and other Interface Equipments. The Annual Maintenance shall be for 10 years after warranty period is over. Warranty shall be as per standard IRS condition of contract <del>i.e. 24/30 months</del>. The Tenderer shall quote year wise rates of AMC detailing the various maintenance schedules enlisting the requirement of material/ spare parts, consumables, and services to be rendered by him in regular intervals. All these materials, spare parts, consumables and labour requirement shall be arranged by the</p>	Railway Board	<p>It may be clarified in Cl 1.23 that during warranty period &amp; AMC all the required spares and consumables except oil and fuel. Are to be supplied by the supplier at its own cost. The supplier also has to arrange all necessary UES (unit exchange spares). So that for carrying out any repair/maintenance to any components and the total downtime should be within the limits prescribed in the tender document. Railway's responsibility is limited to providing fuel, engine oil &amp; lubricants only, required for operation of the NETRA Car.</p>	Accepted Paragraph modified accordingly.	<p>1.23.1 The Supplier shall quote for AMC of all Equipment/Components of Measuring System such as Transducers, Load Cells, Strain Gauges, High Resolution Camera, On Board Computers, Laser Printers and Plotters, UPS and other Interface Equipments etc. The Annual Maintenance shall be for 10 years after warranty period is over. Warranty shall be as per standard IRS condition of contract. All materials, spare parts, consumables (except fuel oil) and labour requirement shall be arranged by the successful Tenderer at his own cost, during the course of warranty &amp; AMC. The AMC shall be comprehensive for all Equipments of Measuring system covering scheduled as well as break down maintenance. The Tenderer shall keep adequate spares in stock accordingly. AMC shall be inclusive of replacement of parts, if required, either due to breakdown or due to regular wear and tear.</p>
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		<p>successful Tenderer during the course of AMC. The AMC shall be comprehensive for all Equipments of Measuring system covering scheduled as well as break down maintenance. The Tenderer shall keep adequate spares in stock accordingly. AMC shall be inclusive of replacement of parts, if required, either due to breakdown or due to regular wear and tear.</p> <p>1.23.2 The cost of OHE Recording Car, including the AMC cost of Measuring System, shall be considered while evaluating the inter-se tender position. It shall be compulsory for the Tenderer to quote for AMC without which the offer shall be summarily rejected.</p> <p>1.23.3 Supplier shall submit various maintenance schedules such as</p>			<p>It is commercial clause and may be included in tender documents.</p> <p>Paragraph redrafted.</p>	<p>1.23.2 deleted</p> <p>1.23.3 Supplier shall submit various maintenance schedules such as Daily/Weekly, Monthly, Quarterly, Half yearly and</p>
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		<p>Daily/Weekly, Monthly, Quarterly, Half yearly and Yearly schedules of all Equipments along with the offer.</p> <p>1.23.4 During warranty period, scheduled maintenance such as Daily/Weekly checks, Monthly, Quarterly, Half yearly and Yearly schedules of Measuring Equipment/Components shall be done by the successful contractor for which no extra cost shall be paid by the Railways. However, Scheduled maintenance of Car Equipments/Components, other than Measuring Equipments, shall be carried out by the Railways during the warranty period.</p> <p>1.23.5 After expiry of Warranty period, the successful Tenderer shall have to maintain all the Equipments/Components</p>			<p>Paragraph re drafted</p> <p>Paragraph re drafted</p>	<p>Yearly schedules of all Equipments at design clearance stage.</p> <p>1.23.4 During warranty period, scheduled maintenance such as Daily/Weekly checks, Monthly, Quarterly, Half yearly and Yearly schedules of Measuring &amp; recording Equipment/Components shall be done by the successful contractor for which no extra cost shall be paid by the Railways. However, Scheduled maintenance of Car Equipments/Components, other than Measuring &amp; recording Equipments, shall be carried out by the Railways during the warranty period.</p> <p>1.23.5 After expiry of Warranty period, the successful Tenderer shall have to maintain all the Equipments/Components of</p>
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		<p>of the Measuring System of the OHE Recording Car, during AMC period of 10 years. The Equipments, other than Measuring Equipments/Components, shall be maintained by the Railways.</p> <p>1.23.6 In case of failure of any Equipment, during Warranty as well as AMC period, it shall be repaired or replaced within reasonable time not exceeding 05 days from the day of reporting by the consignee. After this period of 05 days, penalty at the rate of Rs. 5000 (Rupees Five Thousand) per day (flat) shall be imposed on the contractor for each day, or its part thereof.</p>				<p>the Measuring &amp; recording System of the OHE Recording Car, during AMC period of 10 years. The Equipments, other than Measuring &amp; recording Equipments/Components, shall be maintained by the Railways.</p> <p>Paragraph deleted</p>
5.	3.3.4 &  3.3.5	<p>Emission from OHE Recording Car to outside world shall be limited to level specified under CENELEC</p> <p>Standard 50121-2. The tenderer shall submit the simulated values of these interference currents in their</p>	Railway Board	<p>Error: Emission from OHE Recording Car to outside world shall be limited to level specified under CENELEC Standard 50121-2. The tenderer</p>	Accepted, Typographical error and corrected	<p>3.3.4 Emission from OHE Recording Car to outside world shall be limited to level specified under CENELEC standard 50121-2</p> <p>3.3.5 The tenderer shall submit the simulated</p>

		offer.		shall submit the simulated values of these interference currents in their offer.		values of these interference currents as mentioned in para 3.3.4 above in their offer.
6.	4.1 Para2	The tenderer shall submit a detailed scheme along with the measuring equipment with offer.	Railway Board	This may be elaborated in annexure-III (Clause 20 may be kept as clause No. 2)	Already in annexure-III	Already in annexure-III at SN-20
7.	4.1 para-3	Vehicle Parameter/ Transmission System:- Details of the transmission system along with equipment/fittings shall be submitted with the offer. Brake system:- UIC/RDSO approved Air brake system.... type of brake blocks and literature on brake equipment's proposed along-with offer..... Batteries:- As per standards of the manufacturer suitable for mentioned applications (details to be submitted)	Railway Board	This may be included in annexure-III, if essentially required.  This may be included in annexure-III, if essentially required.  At what stage details are to be submitted	Required information to be sought at offer stage are already mentioned in annexure-III.	Already in annexure-III.
8.	4.3.9	The supplier shall clearly spell out the emission standards of the engine being offered.	Railway Board	May be included in annexure III, if required.	Already included in Annexure-III at SN-27	Already included in Annexure-III at SN-27
9.	4.13	The tenderer shall furnish, along with schematic circuit diagrams, the power, auxiliary and control scheme proposed to be followed.	Railway Board	May be included in annexure III, if required.	Clause modified to submit the details during design approval stage.	The tenderer shall furnish, the schematic circuit diagrams, the power, auxiliary and control scheme proposed to be followed during design approval stage.

10.	SN 13 of Para 2.2 of chapter - 2	All wheels with clasp/disc brakes	Carraige Dte	SN 13 of Para 2.2 of chapter- 2, may please be re-examined as thermal load on wheels may be increased beyond permissible limits during braking at 160 kmph.	No comments received from manufacturers on this issue during neither Rev-1 or rev-2 of the specification.	--
11.	SN 3 of para 4.1 of chapter 4	<p>Axle: Conforming to RDSO's Drawing No. IRS R-43/92</p> <p>Wheels: Conforming to RDSO's Drawing No. IRS R-19/93</p> <p>Frame, frame components and bogie:- As per standards of the manufacturer suitable for mentioned applications. Suitable bogie design may be explored by the manufacturer and design to be submitted for approval of RDSO with the FE analysis of</p>	Carriage Dte	<p>Para may be corrected at SN 3 of para 4.1 of chapter 4:- Conforming to RDSO's Drawing Specification No. IRS R-43/92 or and shall comply with UIC 515-3/EN 13104.</p> <p>Conforming to RDSO's Drawing Specification No. IRS R-19/93 Part II or EN 13262 and shall comply with EN 13979-1.</p> <p>As per standards of the manufacturer suitable for mentioned applications. Suitable bogie design may be</p>	<p>Accepted, paragraph modified accordingly.</p> <p>Accepted paragraph modified accordingly.</p> <p>Accepted paragraph modified accordingly.</p>	<p>Conforming to RDSO's Specification No. IRS R-43/92 or and shall comply with UIC 515-3/EN 13104.</p> <p>Conforming to RDSO's Specification No. IRS R-19/93 Part II or EN 13262 and shall comply with EN 13979-1.</p> <p>As per standards of the manufacturer suitable for mentioned applications. Suitable bogie design may be explored by the manufacturer and design to be submitted for approval of RDSO with the FE analysis of bogie design &amp; detailed strength calculations (including static and</p>



		bogie design. Required tests shall be conducted on the bogie as decided by RDSO at design approval stage.		explored by the manufacturer and design to be submitted for approval of RDSO with the FE analysis of bogie design & detailed strength calculations (including static and fatigue). Required tests shall be conducted on the bogie as decided by RDSO at design approval stage.		fatigue). Required tests may be conducted on the bogie as decided by RDSO at design approval stage.
12.	SN 14 of Para 4.1 of Chapter 4.	New inclusion	Carraige Dte	(a) One Prototype bogie frame with all mounting brackets shall be subjected to stress investigation and fatigue test in accordance with UIC 615-4 and UIC 515-4 or EN 13749. The test shall be under simulated loading condition to represent the service load. (b) Wheel disc and axle shall be subjected to type	This shall be decided during design clearance stage. The para 4.1 of this specification is in line with DETC specification	-

				tests and routine tests as per IRS R-19/93 Part-II/EN 13262 & EN 13979-1 and IRS R-43/92/EN 13261 & UIC 515-3/EN 13104.		
13.	Annexure-II,	Correction in list of exhibited drawings	Carriage Dte	In the list of exhibited drawings of wheels RDSO Drg. No. IRS R-19/93, may be replaced as RDSO Drg. No. Sketch-W/WL-1660 (for speed up to 110 kmph & 16.25t axle load) and RCF drawing no. LW0MI6590(for speed up to 160 kmph & 16.25t axle load)	Accepted paragraph amended accordingly.	and RDSO Drg. No. Sketch-W/WL-1660 (for speed up to 110 kmph and RCF drawing no. LW0MI6590 (for speed up to 160 kmph )
14.		1.2.1 Each NETRA Car should have the following features: a) Good aesthetics. b) High comfort levels. c) Passenger amenities. d) Ease of maintenance. e) Longer periodicity between overhauls.		TI	Paragraph deleted	-

		<ul style="list-style-type: none"> <li>f) Low life cycle cost.</li> <li>g) Low weight.</li> <li>h) Flush level/ smooth exteriors.</li> <li>i) Use of interchangeable, modular components.</li> <li>j) Extensive and prominent labeling of parts.</li> <li>k) High reliability.</li> <li>l) Fire and smoke detection.</li> <li>m) Use of fire retardant materials.</li> <li>n) Environment friendly.</li> <li>o) Maximum possible commonality of structure, components, equipments and sub-systems in the different types of cars.</li> </ul>				
15.		<p>1.6.3 The successful bidder shall submit a copy of English version of International specifications used for design and manufacture of OHE Recording Car. However, confirmation of</p>		TI	Paragraph amended	The successful bidder shall submit a copy of English version of International specifications used for design and manufacture of OHE Recording Car.

		this shall be given in bid documents.				
16.	1.7.1	The successful tenderer (hereafter called as contractor) shall develop the design based on the details given in this specification and sound engineering practices. The entire design & technical data along with calculations shall be submitted to RDSO within 120 days for approval before commencing construction of OHE recording car or placing orders on sub-contractors.		TI	Timeline has been removed. It may be included in tender documents	The successful tenderer (hereafter called as contractor) shall develop the design based on the details given in this specification and sound engineering practices. The entire design & technical data along with calculations shall be submitted to RDSO for approval before commencing construction of OHE recording car or placing orders on sub-contractors.
17.	1.7.3	From the information given in this specification and instructions of RDSO, the contractor shall prepare a full set of engineering drawings and submit the same to RDSO for approval within 120 days.		TI	Timeline has been removed. It may be included in tender documents	From the information given in this specification and instructions of RDSO, the contractor shall prepare a full set of engineering drawings and submit the same to RDSO for approval.
18.	1.12.3	The photographs shall be not less than 380 mm x 255 mm for the side views of the complete coach, or less than 255 mm x 200 mm for other views.		TI	Paragraph deleted	1.12.3 deleted

19.	1.12.4	The soft copy on compact disc (CD) and Pen Drive and three sets of prints of each shall be furnished to the Engineers. the prints being mounted on sheets to form complete set.		TI	Paragraph re-drafted	The soft copy on compact disc (CD) and Pen Drive and three sets of prints of each shall be furnished to the Engineers.
20.	1.13 and 1.14	Training on vehicle:- Training on measuring instrument		TI	Paragraph are deleted and redrafted as 1.13 & 1.13.1	Re-drafted as mentioned final draft specification.
21.	1.16.2	The Supplier shall demonstrate to the IR, the satisfactory functioning of the tools, jigs & instruments supplied vide Clause 1.16.1 during commissioning:-		TI	Paragraph deleted	1.16.2 Deleted
22.	1.18.3	A spare part catalogue listing all components manufactured or purchased by the tenderer shall be prepared within 45 days of design approval. The contractor shall furnish one copies of spare parts catalogue to RDSO and two copies to the consignee free of cost:-		TI	Paragraph deleted	-
23.	1.19.1	The OHE Recording Car shall not be dispatched or		TI	Re-drafted	1.19.1 The OHE Recording Car shall

		packed until the Final clearance from RDSO Inspecting Officer has passed it. Such clearance passing shall in no way exonerate the contractor from obligation in respect of quality and performance of the equipment. In the event of dispute between the Inspecting Officer and the Contractor, the decision of the Purchaser shall be final and binding.				not be dispatched or packed until the Final clearance from RDSO is granted Inspecting Officer has passed it. Such clearance passing shall in no way exonerate the contractor from obligation in respect of quality and performance of the equipment. In the event of dispute between the Inspecting Officer and the Contractor, the decision of the Purchaser shall be final and binding.
24.	1.19.2	The consignee shall inform the Contractor after the OHE Recording Car has reached at site. The OHE Recording Car shall be commissioned by the Contractor within 4 weeks after intimation by the consignee. The consignee will issue a commissioning certificate after it has been successfully commissioned.		TI	Paragraph deleted	-
25.	1.23.1	The Supplier shall quote for AMC of all Equipment/Components of Measuring System such as Transducers, Load		TI	Re-drafted, Commercial details deleted and may be included in Tender documents.	The Supplier shall quote for AMC of all Equipment/Components of Measuring System such as Transducers, Load Cells,

		<p>Cells, Strain Gauges, High Resolution Camera, On Board Computers, Laser Printers and Plotters, UPS and other Interface Equipments etc. The Annual Maintenance shall be for 10 years after warranty period is over. Warranty shall be as per standard IRS condition of contract. The Tenderer shall quote year wise rates of AMC detailing the various maintenance schedules enlisting the requirement of material/ spare parts, consumables, and services to be rendered by him in regular intervals. All these materials, spare parts, consumables (except fuel oil) and labour requirement shall be arranged by the successful Tenderer, during the course of AMC. The AMC shall be comprehensive for all Equipments of Measuring system covering scheduled as well as break down maintenance. The Tenderer shall keep adequate spares in stock</p>				<p>Strain Gauges, High Resolution Camera, On Board Computers, Laser Printers and Plotters, UPS and other Interface Equipments etc. The Annual Maintenance shall be for 10 years after warranty period is over. Warranty shall be as per standard IRS condition of contract. <del>The Tenderer shall quote year wise rates of AMC detailing the various maintenance schedules enlisting the requirement of material/ spare parts, consumables, and services to be rendered by him in regular intervals.</del> All these materials, spare parts, consumables (except fuel oil) and labour requirement shall be arranged by the successful Tenderer at his own cost, during the course of warranty period &amp; AMC. The AMC shall be comprehensive for all Equipments of Measuring system covering scheduled as well as break down maintenance. The Tenderer shall keep adequate spares in stock accordingly. AMC shall be inclusive of replacement of parts, if required, either due to breakdown or due to regular wear and tear.</p>
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		accordingly. AMC shall be inclusive of replacement of parts, if required, either due to breakdown or due to regular wear and tear.				
26.	1.23.2	The cost of OHE Recording Car, including the AMC cost of Measuring System, shall be considered while evaluating the inter-se tender position. It shall be compulsory for the Tenderer to quote for AMC without which the offer shall be summarily rejected.		TI	Paragraph deleted. It is commercial clause. May be included in tender documents.	-
27.	1.23.3	Supplier shall submit various maintenance schedules such as Daily/Weekly, Monthly, Quarterly, Half yearly and Yearly schedules of all Equipments along with the offer.			Paragraph redrafted	Supplier shall submit various maintenance schedules such as Daily/Weekly, Monthly, Quarterly, Half yearly and Yearly schedules of all Equipments <del>along with the offer</del> at design clearance stage.
28.	1.23.6	In case of failure of any Equipment, during Warranty as well as AMC period, it shall be repaired or replaced within reasonable time not exceeding 05 days from			Paragraph deleted. It is commercial clause. May be included in tender documents.	-



		the day of reporting by the consignee. After this period of 05 days, penalty at the rate of Rs. 5000 (Rupees Five Thousand) per day (flat) shall be imposed on the contractor for each day, or its part thereof.				
29.	3.1.5 of chapter-3	The pantograph of OHE Recording Car may be fitted with instrumentation such as transducers, load cells and strain gauges etc. as required but such fitment shall not materially affect the static/ dynamic performance of the OHE Recording Car pantograph. The sensors are preferably to be installed on the roof of car and non-contact measurement shall be preferred. The transducers shall be properly protected against mechanical, environmental and electrical interferences. The cameras shall have high resolution high frequency suitable for capturing of images at the			Paragraph re-drafted	The pantograph of OHE Recording Car may be fitted with instrumentation such as transducers, load cells and strain gauges etc. as required but such fitment shall not materially affect the static/ dynamic performance of the OHE Recording Car pantograph. The sensors are preferably to be installed on the roof of car and non-contact measurement shall be preferred. The transducers shall be properly protected against mechanical, environmental and electrical interferences. The cameras shall have high resolution high frequency suitable for capturing of images at the specified speeds. <del>The cameras and other equipment shall be protected for ingress of dust and water with IP-68 Protection.</del>

		specified speeds. The cameras and other equipment shall be protected for ingress of dust and water with IP-68 Protection.				
30.	Clause 3.1.6 of chapter-3	-		TI	Added a new parameter in line with MRI specification.	(Q) Hot spot measurement:- The hot spot of OHE shall be detected using infra-red camera and recording shall be processed and reports shall be generated by on-board computers.
31.	SN-2 of clause 4.1 of chapter-4	Added new parameter			Hot spot measurement added	The OHE Recording car shall have following features and shall be equipped for measuring and recording OHE parameters such as - <ol style="list-style-type: none"> <li>1. Stagger of contact wire</li> <li>2. Height of contact wire</li> <li>3. Thickness of contact wire</li> <li>4. Gradient of the contact wire</li> <li>5. Setting Distance/Implantation</li> <li>6. Contact Force</li> <li>7. Pantograph acceleration Vertical</li> <li>8. Pantograph acceleration Lateral</li> <li>9. Body Vertical Acceleration</li> </ol>

						10. Body lateral Acceleration 11. Loss of contact 12. Mast Identification System 13. Hard Spots 14. Speed 15. Distance 16. Identification of Crossover/turnout 17. OHE Voltage 18. Hot spot 19. Video & Audio Recording of OHE Pantograph interaction
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**List of tools & Special tools:**

Sl.No.	Tool description	Quantity
1	Box spanner set 10-34 mm	1 set
2	Ring Spanner 6-33 mm	1 set
3	Double end spanner set 6-36 mm	1 set
4	Grease gun	1
5	Torque wrench EVT 2000@	1
6	Pipe wrench 18"	1
7	Hammer 2 Lbs	1
8	Screw Driver 6"	1
9	Screw Driver 12"	1
10	Chisel 6"	1
11	Cutting plier	1
12	L N key set 3 to 17	1 set
13	Axle Box Hydraulic Bearing puller	1
14*	Emergency Spares	1 Kit
*Emergency Spares: consists of Fuses, Control Panel lamps, MCBs and Critical Hoses.		

**Testing Kit:**

Sl.No.	Tool description	Quantity(Nos)
1	Injector adjustment Kit	1
2	Vacuum gauge (90-30 inch of Hg)	1
3	Pressure Gauge (0-30 PSI)	1
4	Hand tacho Meter (0-3000 RPM)	1
5	Dial gauge (Least Count=0.001")	1
6	Magnetic gauge	1
7	Megger 500 V	1
8	Multi-Meter (DC Range: 400 mV AC Range: 400mV-750 V Resistance: 400 ohm to 40 Mega ohms)	1