

Addendum No. 2

Tender No. CMRL / PHASE 1 / SYS / ARE05 / 2025

Design, Manufacture, Supply, Testing, Commissioning of Standard Gauge Metro Rolling Stock (Electrical Multiple Units) and Depot Machinery & Plant and Training of Personnel

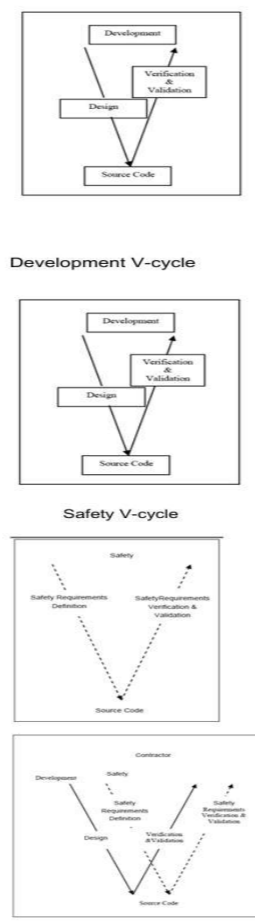
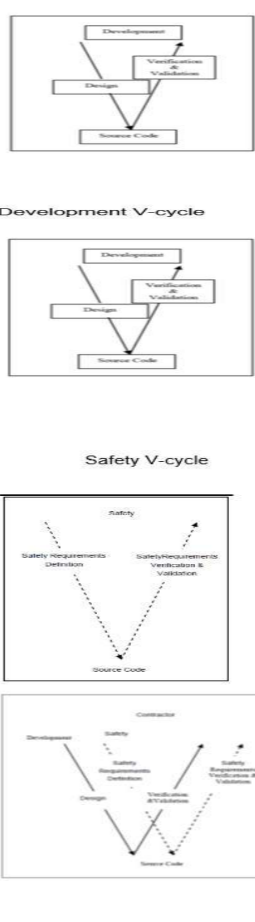
S. No.	Part	Section	Clause No.	Original / Amended Bid Condition	Revised Bid Condition
1	Part 1	Section-III (EQC)	2.5 Item No. 2 Propulsion (Traction converter, Auxiliary converter and Traction motors) (Addendum No.1 S.No.15)	<p>The designer of Traction converter-inverter shall be considered as the integrator of the Propulsion system and shall individually have experience of minimum ten (10) years in the Design and Manufacturing of Traction converter-inverter / Inverter for Metro rolling stock AND the system supplied have been in satisfactory revenue operation for at least five (5) years in minimum aggregate 500 cars comprising of both powered and non-powered cars, supplied against minimum five (5) different contracts in the Metro Railway (i.e. MRT, Metro-lite, LRT, Suburban Railways, EMU, MEMU or high speed railways) of minimum two (2) different countries outside the country of origin or in India. Integrator of the propulsion system shall have the entire responsibility for any warranty obligations and design modifications of propulsion system during the contract period for which it should have adequate past experience. Besides, other suppliers must qualify for respective scope of work against the eligibility criteria as per the eligibility conditions mentioned in the respective tenders of the metros</p> <p>(or)</p> <p>Manufacturer of the Propulsion Equipment (Traction Converter-Inverter, Auxiliary Converter-Inverter and Traction Motor) proposed by the Bidder as a sub-contractor for supply of the Propulsion Equipment against this Bid, shall have minimum ten (10) years experience in the field of Design and Manufacturing of the Propulsion Equipment AND do the Propulsion Equipment Designed, Manufactured and Supplied by the said manufacturer have been in satisfactory revenue operation for at least five (5) years in minimum aggregate 500 cars comprising of both powered and non-powered cars, supplied against minimum five (5) different contracts in the Metro Railway (i.e. MRT, Metrolite, LRT, Sub-urban Railways, EMU, MEMU or high speed railways) of minimum two (2) different countries outside the country of origin or in India.</p> <p>Note: Bidders shall note that experience of propulsion equipment supplied for Light Rail Vehicle, Tramways shall not be considered for fulfillment of the above eligibility criteria</p>	<p>The designer of Traction converter-inverter shall be considered as the integrator of the Propulsion system and shall individually have experience of minimum ten (10) years in the Design and Manufacturing of Traction converter-inverter / Inverter for Metro rolling stock AND the system supplied have been in satisfactory revenue operation for at least five (5) years in minimum aggregate 500 cars comprising of both powered and non-powered cars, supplied against minimum five (5) different contracts in the Metro Railway (i.e. MRT, LRT, Suburban Railways or high speed railways) of minimum two (2) different countries outside the country of origin or in India. Integrator of the propulsion system shall have the entire responsibility for any warranty obligations and design modifications of propulsion system during the contract period for which it should have adequate past experience. Besides, other suppliers must qualify for respective scope of work against the eligibility criteria as per the eligibility conditions mentioned in the respective tenders of the metros</p> <p>(or)</p> <p>Manufacturer of the Propulsion Equipment (Traction Converter-Inverter, Auxiliary Converter-Inverter and Traction Motor) proposed by the Bidder as a sub-contractor for supply of the Propulsion Equipment against this Bid, shall have minimum ten (10) years experience in the field of Design and Manufacturing of the Propulsion Equipment AND do the Propulsion Equipment Designed, Manufactured and Supplied by the said manufacturer have been in satisfactory revenue operation for at least five (5) years in minimum aggregate 500 cars comprising of both powered and non-powered cars, supplied against minimum five (5) different contracts in the Metro Railway (i.e. MRT, LRT, Sub-urban Railways or high speed railways) of minimum two (2) different countries outside the country of origin or in India.</p> <p>Note: Bidders shall note that experience of propulsion equipment supplied for Light Rail Vehicle, Tramways shall not be considered for fulfillment of the above eligibility criteria.</p>
2	Part 1	Section-IV (BF)	5.15	5.15 CERTIFICATE CONFIRMING MINIMUM LOCAL CONTENT	5.15 CERTIFICATE CONFIRMING MINIMUM LOCAL CONTENT - replaced by Annexure (01) to Addendum No.2
3	Part 2	-	Addendum No.1 S.No. 75	The signal representing the braking demand level, transmitted by the brake control system, shall be of a resolution fine enough to enable the UTO to operate satisfactorily and shall be coordinated with the UTO design requirements.	Deleted
4	Part 2	Section –VI A Chapter 2 System Requirements	2.15.8.18	The signal representing the braking demand level, transmitted by the brake control system, shall be of a resolution fine enough to enable the ATO to operate satisfactorily and shall be coordinated with the ATO design requirements.	The signal representing the braking demand level, transmitted by the brake control system, shall be of a resolution fine enough to enable the UTO to operate satisfactorily and shall be coordinated with the UTO design requirements.
5	Part 2	-	Addendum No.1 S.No. 88	Mode change dead time for transition from one mode to adjacent mode (motoring to coasting, coasting to braking, braking to coasting and coasting to motoring) shall not exceed 500 ms, exclusive of jerk limiting. This shall be the applicable for all UTO and Non-UTO modes of operation.	Deleted
6	Part 2	Section –VI A Chapter 2 System Requirements	2.24.3	Mode change dead time for transition from one mode to adjacent mode (motoring to coasting, coasting to braking, braking to coasting and coasting to motoring) shall not exceed 500 ms, exclusive of jerk limiting. This shall be the applicable for all ATO and ATP modes of operation.	Mode change dead time for transition from one mode to adjacent mode (motoring to coasting, coasting to braking, braking to coasting and coasting to motoring) shall not exceed 500 ms, exclusive of jerk limiting. This shall be the applicable for all UTO and Non-UTO modes of operation.

S. No.	Part	Section	Clause No.	Original / Amended Bid Condition	Revised Bid Condition
7	Part 2	-	Addendum No.1 S.No. 108	<p>The Contractor shall submit a detailed technical analysis to derive predicted values for the following criteria for collision of trainset according to the scenarios stated below:</p> <p>a) Scenarios:</p> <p>(i) When 6-car trainset loaded to AW2 loaded condition colliding with a stationary AW2 loaded condition 6-car trainset with maximum parking brakes applied condition.</p> <p>(ii) When 6-car trainset loaded to AW2 loaded condition colliding with a stationary AW2 loaded condition 6-car trainset with unbraked condition.</p> <p>(iii) When existing 4-car trainset loaded to AW2 loaded condition colliding with a stationary AW2 loaded condition 6-car trainset with maximum parking brakes applied condition.</p> <p>(iv) When existing 4-car trainset loaded to AW2 loaded condition colliding with a stationary AW2 loaded condition 6-car trainset with unbraked condition.</p> <p>b)Criteria:</p> <p>i) The maximum collision speed at which there is no structural damage to the car body and the coupler.</p> <p>ii) The minimum collision speed at which the coupler energy absorption device fails.</p> <p>iii) The minimum speed at which actual structural damage commences.</p> <p>iv) The maximum speed at which the cab structural collapse features deform completely, without damage to the main car body structure.</p>	Deleted
8	Part 2	Section –VI A Chapter 3 Vehicle Body	3.14.5.6	<p>The Contractor shall submit a detailed technical analysis to derive predicted values for the following criteria for collision of trainset according to the scenarios stated below:</p> <p>(i) When 6-car trainset loaded to AW2 loaded condition colliding with a stationary AW2 loaded condition 6-car trainset with maximum parking brakes applied condition.</p> <p>(ii) When 6-car trainset loaded to AW2 loaded condition colliding with a stationary AW2 loaded condition 6-car trainset with unbraked condition.</p> <p>a) The maximum collision speed at which there is no structural damage to the car body and the coupler.</p> <p>b) The minimum collision speed at which the coupler energy absorption device fails.</p> <p>c) The minimum speed at which actual structural damage commences.</p> <p>d) The maximum speed at which the cab structural collapse features deform completely, without damage to the main car body structure.</p>	<p>The Contractor shall submit a detailed technical analysis to derive predicted values for the following criteria for collision of trainset according to the scenarios stated below:</p> <p>a) Scenarios:</p> <p>(i) When 6-car trainset loaded to AW2 loaded condition colliding with a stationary AW2 loaded condition 6-car trainset with maximum parking brakes applied condition.</p> <p>(ii) When 6-car trainset loaded to AW2 loaded condition colliding with a stationary AW2 loaded condition 6-car trainset with unbraked condition.</p> <p>(iii) When existing 4-car trainset loaded to AW2 loaded condition colliding with a stationary AW2 loaded condition 6-car trainset with maximum parking brakes applied condition.</p> <p>(iv) When existing 4-car trainset loaded to AW2 loaded condition colliding with a stationary AW2 loaded condition 6-car trainset with unbraked condition.</p> <p>b)Criteria:</p> <p>i) The maximum collision speed at which there is no structural damage to the car body and the coupler.</p> <p>ii) The minimum collision speed at which the coupler energy absorption device fails.</p> <p>iii) The minimum speed at which actual structural damage commences.</p> <p>iv) The maximum speed at which the cab structural collapse features deform completely, without damage to the main car body structure.</p>
9	Part 2	-	Addendum No.1 S.No. 220	<p>Auxiliary power requirements are described for One Unit of 3 cars (DMC + TC + MC) considering 6 car rake consists of two identical 3 car units for the purpose of auxiliary power supply distribution scheme. The auxiliary power supply shall consist of two static converter & inverters, two back-up batteries & two battery chargers. The Auxiliary Converter shall be suitable for operation at 25 KV AC input supply at pantograph level with the input supply frequency variation from 47~52 Hz and voltage variation from 19~31kV. The failure of auxiliary power supply equipment shall be communicated to TCMS / OCC / BCC. Failure / isolation of main converter shall not cause any reduction in performance of auxiliary converter-inverter. The auxiliary power supply system shall be configured such that it performs reliably for all operating train consists</p>	Deleted

S. No.	Part	Section	Clause No.	Original / Amended Bid Condition	Revised Bid Condition
10	Part 2	Section –VI A Chapter 9– Auxiliary Electrical Equipment	9.2.1	Auxiliary power requirements are described for One Unit of 3 cars (DMC + TC + MC) considering 6 car rake consists of two identical 3 car units for the purpose of auxiliary power supply distribution scheme. The auxiliary power supply shall consist of two static converter & inverters, two back-up batteries & two battery chargers. The Auxiliary Converter shall be suitable for operation at 25 KV AC input supply at pantograph level with the input supply frequency variation from 47~52 Hz and voltage variation from 19~31kV. The failure of auxiliary power supply equipment shall be communicated to TCMS. Failure / isolation of main converter shall not cause any reduction in performance of auxiliary converter-inverter. The auxiliary power supply system shall be configured such that it performs reliably for all operating train consists	Auxiliary power requirements are described for One Unit of 3 cars (DMC + TC + MC) considering 6 car rake consists of two identical 3 car units for the purpose of auxiliary power supply distribution scheme. The auxiliary power supply shall consist of two static converter & inverters, two back-up batteries & two battery chargers. The Auxiliary Converter shall be suitable for operation at 25 KV AC input supply at pantograph level with the input supply frequency variation from 47~52 Hz and voltage variation from 19~31kV. The failure of auxiliary power supply equipment shall be communicated to TCMS / OCC / BCC. Failure / isolation of main converter shall not cause any reduction in performance of auxiliary converter-inverter. The auxiliary power supply system shall be configured such that it performs reliably for all operating train consists
11	Part 2	Section –VI A Chapter 9– Auxiliary Electrical Equipment	9.3.14 (Addendum No.1 S.No. 227)	No failure of the auxiliary converter inverter shall immobilize the train. The Contractor shall submit data on the redundancy level proposed for the auxiliary converter-inverter and shall explain the degraded modes operation philosophy of auxiliary converter inverter. Individual auxiliary converter inverter system shall connect to 50% of the auxiliary loads in each car of 3 car unit (DM+T+M) In the event of a failure of one auxiliary converter inverter, 100% auxiliary loads of each car of 3 car unit (DM+T+M) train shall continue to operate in normal operation. This system shall be designed with proper wiring in between all 6-cars and with the help of adequate car to car jumper cables. Degraded modes and philosophy of degraded operations shall be proposed by the Contractor. The ac output provided by the auxiliary converter inverter shall be such that in the event of one auxiliary Converter Inverter failure, it shall not cause the loss of any essential load specified in clause 9.4.2, saloon lighting, feed extension for battery charger, main transformer oil flow pump, blower fans (if applicable) and shall not cause loss of 100% of VAC Units in each car. In this condition, each car's 100% VAC units shall be operated in cooling mode. Also, failure of one auxiliary converter inverter shall not affect the operation of the other auxiliary converter inverter. Entire operation described in this clause shall occur without any power interruption to the train.	Failure of three auxiliary converter inverter together shall not immobilize the train. The Contractor shall submit data on the redundancy level proposed for the auxiliary converter-inverter and shall explain the degraded modes operation philosophy of auxiliary converter inverter. Individual auxiliary converter inverter system of the 3 car unit (DM+T+M) shall be capable of connecting to 50% of the auxiliary loads in each car of the respective 3 car unit. In the event of a failure of any one auxiliary converter inverter in the train, 100% auxiliary loads of each car of 6 car train shall continue to operate in normal operation. In the event of failure of any two auxiliary converter inverter in the train, there shall be no reduction in other 3-phase & 1-phase loads and it shall not cause the loss of any essential load specified in clause 9.4.2, saloon lighting, feed extension for battery charger, main transformer oil flow pump, cab VAC, blower fans (if applicable) and shall not cause loss of 50% of VAC Units in each car. In this condition, each car's, 50% VAC units shall be operated in cooling mode and other 50% VAC units shall be operated in ventilation mode with fresh air damper closed condition. Also, failure of any one auxiliary converter inverter shall not affect the operation of the other auxiliary converter inverter. This system shall be designed with proper wiring in between all 6-cars and with the help of adequate car to car jumper cables. Degraded modes and philosophy of degraded operations shall be proposed by the Contractor. Entire operation described in this clause shall occur without any power interruption to the train.
12	Part 2	Section –VI A Chapter 9– Auxiliary Electrical Equipment	9.5.1	In the event of failure of any auxiliary power supply equipment on one unit (DMC + TC + MC), the remaining auxiliary power supply equipment must be capable of supplying auxiliary power for 50% of all loads per each car in one unit (DMC + TC + MC), which includes categories of 3 ϕ & 1 ϕ supply. However, 100% DC power supply in all cars at 110 VDC loads, all emergency, safety and essential loads on the complete one unit (DMC + TC + MC) shall function in this condition. In this scenario, this healthy Auxiliary converter inverter shall supply a minimum of 50% of all the VAC units of each car of the train and shall maintain proper comfort of passengers in the train as mentioned in clause 9.3.14.	Deleted
13	Part 2	Section –VI A Chapter 10 - High Voltage & Propulsion System	10.3.2	The pantograph for the 25 KV current collection system shall be suitable for flexible autotensioned OHE consisting of catenary and contact wire as well as the low height rigid catenary system provided in tunnelled sections or other locations of the CMRL Phase 1 network. Each unit (DMC + TC + MC) shall be equipped with ONE (01) pantograph located on the T-car. The feed from the pantographs shall be connected to the main transformer without duplication of High Voltage equipment.	The pantograph for the 25 KV current collection system shall be suitable for flexible autotensioned OHE consisting of catenary and contact wire as well as the low height rigid catenary system provided in tunnelled sections or other locations of the CMRL Phase 1 network. Each unit (DMC + TC + MC) shall be equipped with ONE (01) pantograph located on the T-car. The feed from the pantographs shall be connected to the main transformer without duplication of High Voltage equipment. Pantograph profile should be similar to Phase-1 existing Rolling Stock in order to avoid change in existing Mainline and Depot OCS and to ensure the compatibility.

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14	Part 2	Section –VI A Chapter 10 - High Voltage & Propulsion System	10.3.14 (Addendum No.1 S.No.248)	As per the interface requirement specified in Clause 2.4.50 of the ERTS Appendix-C the ATS system shall ensure staggered closing of the VCBs of trains located in the same section whenever the power supply is restored so as to avoid tripping of substation VCBs due to high inrush current. Necessary selection of commands from RSC consoles of OCC, BCC & DCCs required for closing of VCB shall be ensured as a part of interface design. This system shall be working in all UTO and non-UTO modes of train operation. Design shall be suitable for minimum 90 sec head-way operation of trains in CMRL network.	As per the interface requirement specified in Clause 2.4.56 of the ERTS Appendix-C the ATS system shall ensure staggered closing of the VCBs of trains located in the same section whenever the power supply is restored so as to avoid tripping of substation VCBs due to high inrush current. Necessary selection of commands from RSC consoles of OCC, BCC & DCCs required for closing of VCB shall be ensured as a part of interface design. This system shall be working in all UTO and non-UTO modes of train operation. Design shall be suitable for minimum 90 sec head-way operation of trains in CMRL network.
15	Part 2	Section –VI A Chapter 10 - High Voltage & Propulsion System	10.8.2 (c)	Is able to meet requirements (a) and (b) as well as the RMS line current profile throughout all three (3) corridors; without exceeding any thermal limits.	Is able to meet requirements (a) and (b) as well as the RMS line current profile throughout all corridors of Phase 1 & Phase 1 Extn. Network; without exceeding any thermal limits.
16	Part 2	Chapter 13 - Communications	13.7.1.16	13.7.1.16 Displays for advertisement Purpose 13.7.1.16.1 18 no's of LCD with LED backlit displays (or superior technology) shall be provided inside each coach. Screens shall be at least 27" corner to corner and 16:9 aspect ratio. Display locations and specification shall be submitted for CMRL approval. 13.7.1.16.2 These displays shall support for broadcasting advertisements in video and picture formats, CMRL promotional videos and route related information. 13.7.1.16.3 By default, these display shall show the route related information similar to Electronic route maps. Provision shall be made available for CMRL to switch over these displays into commercial mode for broadcasting advertisements from single point in the train. 13.7.1.16.4 The Contractor shall provide necessary storage devices for enabling CMRL to upload the video & Picture files from a single point in train to broadcast on all the train's displays. 13.7.1.16.5 Necessary interfaces shall be provided for broadcasting advertisements in a logical manner such as broadcasting multiple videos one after other or broadcasting a single video for a specified period, broadcasting advertisements at a specific location or station, etc. 13.7.1.16.6 During the Emergency / Rescue operation these displays must show the necessary instructions for the passenger to operate Emergency Exit door. This control shall be done from TCMS. 13.7.1.16.7 Adequate protection shall be ensured to protect the displays from vandalism.	13.7.1.16 Displays for Safety, Operational, Advertisement and Emergency Purpose 13.7.1.16.1 18 no's of LCD with LED backlit displays (or superior technology) shall be provided inside each coach. Screens shall be at least 27" corner to corner and 16:9 aspect ratio. Display locations and specification shall be submitted for CMRL approval. 13.7.1.16.2 These displays shall support for broadcasting Safety, Operational, Advertisement and Emergency in video and picture formats, CMRL promotional videos and route related information. 13.7.1.16.3 By default, these display shall show the route related information similar to Electronic route maps. Provision shall be made available for CMRL to switch over these displays into commercial mode for broadcasting advertisements from single point in the train. Incase of any emergency, priority shall be given for broadcasting emergency video. 13.7.1.16.4 The Contractor shall provide necessary storage devices for enabling CMRL to upload the video & Picture files from a single point in train to broadcast on all the train's displays. 13.7.1.16.5 Necessary interfaces shall be provided for broadcasting advertisements in a logical manner such as broadcasting multiple videos one after other or broadcasting a single video for a specified period, broadcasting advertisements at a specific location or station, etc. 13.7.1.16.6 During the Emergency / Rescue operation these displays must show the necessary instructions / information for the passenger. This control shall be done from TCMS, OCC, BCC & DCC. 13.7.1.16.7 Adequate protection shall be ensured to protect the displays from vandalism. 13.7.1.16.8 In the event of fire detection, the necessary interface shall be provided to enable broadcasting of the emergency video. This control shall be available through TCMS and FDS.
17	Part 2	Section - VI A Chapter 14 – Train Control Management System (TCMS)	14.7.1.3 (d) (Addendum No.1 S.No. 340)	Doors system, including detainment doors status	Doors system, including Saloon to Cab door & Cab access door status
18	Part 2	Section –VI A Chapter 17 – Test Program	17.5.4.4 (c)	All three cars of the rake shall be coupled and checked for proper inter-car and coupler clearance under the worst-case geometric conditions	All six cars of the rake shall be coupled and checked for proper inter-car and coupler clearance under the worst-case geometric conditions
19	Part 2	Section –VI A Chapter 17 – Test Program	17.5.4.5	Trainline Test The first three car rake shall be tested to demonstrate that all trainline functions perform satisfactorily between cars when cars are coupled together. These tests shall include dynamic and static tests. Cars shall be coupled in all possible combinations with trainlines verified from both ends of the rake.	Trainline Test The first six car rake shall be tested to demonstrate that all trainline functions perform satisfactorily between cars when cars are coupled together. These tests shall include dynamic and static tests. Cars shall be coupled in all possible combinations with trainlines verified from both ends of the rake.

S. No.	Part	Section	Clause No.	Original / Amended Bid Condition	Revised Bid Condition
20	Part 2	Section –VI A Chapter 17 – Test Program	17.5.4.6	Door Operation Test Before delivery, the first three car rake shall have all doors operated in similar operating simulation for 1,000 continuous trouble-free cycles while loaded to AW4 conditions. Any door or door control failure occurring prior to completion of the test will nullify the test, and the test shall be re-run completely after the fault has been corrected	Door Operation Test Before delivery, the first six car rake shall have all doors operated in similar operating simulation for 1,000 continuous trouble-free cycles while loaded to AW4 conditions. Any door or door control failure occurring prior to completion of the test will nullify the test, and the test shall be re-run completely after the fault has been corrected
21	Part 2	Section –VI A Chapter 17 – Test Program	17.5.4.7	Light Intensity Test Light intensity readings shall be taken (without light from other sources) on one three car rake to verify conformance with the requirements clause 8.3.	Light Intensity Test Light intensity readings shall be taken (without light from other sources) on one six car rake to verify conformance with the requirements clause 8.3.
22	Part 2	Section –VI A Chapter 17 – Test Program	17.5.4.8.1	General Three car rake running tests shall be performed on systems related to traction and braking on the first rake in CMRL section. The tests shall verify the requirements of Chapter 2 and all individual Chapters related to the test. This series of tests shall also be used to determine the equipment settings and calibrations to be used for the rake acceptance program. All three car rake performance tests shall be performed on CMRL's designated test site. A clearance test will be conducted on CMRL's system. If any three car rake under any load condition or rake configuration, or any apparatus fails to satisfy the specified performance and design criteria, the cars, with the necessary adjustments, shall be re-tested at the Contractor's expense. If modifications are necessary, they shall be verified by appropriate retest, as determined by CMRL, and implemented on a fleet-wide basis at the Contractor's expense as retrofits or modifications	General Six car rake running tests shall be performed on systems related to traction and braking on the first rake in CMRL section. The tests shall verify the requirements of Chapter 2 and all individual Chapters related to the test. This series of tests shall also be used to determine the equipment settings and calibrations to be used for the rake acceptance program. All six car rake performance tests shall be performed on CMRL's designated test site. A clearance test will be conducted on CMRL's system. If any six car rake under any load condition or rake configuration, or any apparatus fails to satisfy the specified performance and design criteria, the cars, with the necessary adjustments, shall be re-tested at the Contractor's expense. If modifications are necessary, they shall be verified by appropriate retest, as determined by CMRL, and implemented on a fleet-wide basis at the Contractor's expense as retrofits or modifications
23	Part 2	Section –VI A Chapter 17 – Test Program	17.5.4.8.5	Thermal Capacity Tests One three car rake shall be instrumented and tested to verify compliance with the duty cycle requirements specified in Chapter 2 and Chapter 10	Thermal Capacity Tests One six car rake shall be instrumented and tested to verify compliance with the duty cycle requirements specified in Chapter 2 and Chapter 10
24	Part 2	Section –VI A Chapter 17 – Test Program	17.5.4.8.11 (a)	Ride quality tests shall be performed on one three car rake. The tests shall prove compliance with the ride quality requirements of clause 2.13.4	Ride quality tests shall be performed on one six car rake. The tests shall prove compliance with the ride quality requirements of clause 2.13.4
25	Part 2	Section –VI A Chapter 17 – Test Program	17.5.4.8.11 (b)	At a minimum, ride quality tests shall consist of operating the three car rake at speeds up to 90 kmph over track segments selected by CMRL, under two load conditions: AW0 and AW4	At a minimum, ride quality tests shall consist of operating the six car rake at speeds up to 90 kmph over track segments selected by CMRL, under two load conditions: AW0 and AW4
26	Part 2	Section –VI A Chapter 17 – Test Program	17.5.4.8.12 (a)	After equipment installation, noise and vibration tests shall be performed on one of the three car rake to confirm compliance with the requirements of clause 2.13 and 2.17	After equipment installation, noise and vibration tests shall be performed on one of the six car rake to confirm compliance with the requirements of clause 2.13 and 2.17
27	Part 2	Section –VI A Chapter 17 – Test Program	17.5.4.8.15	One three car rake equipped with all interior finish and all underframe mounted equipment, shall be tested to demonstrate the effectiveness of the equipment in meeting the specified temperature and humidity conditions inside the car as per Section VI A ERTS (RS) Chapter 7. Heating and humidifying equipment shall be provided in the car for test purposes. Complete train shall be tested for below points as minimum with the requirements of Section VI A ERTS (RS) Chapter 07	<u>Replace the paragraph with following:</u> One six car rake equipped with all interior finish and all underframe mounted equipment, shall be tested to demonstrate the effectiveness of the equipment in meeting the specified temperature and humidity conditions inside the car as per Section VI A ERTS (RS) Chapter 7. Heating and humidifying equipment shall be provided in the car for test purposes. Complete train shall be tested for below points as minimum with the requirements of Section VI A ERTS (RS) Chapter 07
28	Part 2	Section –VI A Chapter 17 – Test Program	17.8.1 (b)	All aspects of car construction and manufacture that cannot be tested at the Contractor's facility shall be tested at this time. Testing shall include verification of trainline operation for three-unit train consists. Test procedures for rake acceptance tests on CMRL property shall be submitted at least three months in advance	All aspects of car construction and manufacture that cannot be tested at the Contractor's facility shall be tested at this time. Testing shall include verification of trainline operation for six-unit train consists. Test procedures for rake acceptance tests on CMRL property shall be submitted at least three months in advance
29	Part 2	Section –VI A Chapter 17 – Test Program	17.8.5	The following tests and adjustments shall be performed at the acceptance site on each three-car rake prior to Non-Regression Static testing at CMRL	<u>Replace the paragraph with following:</u> The following tests and adjustments shall be performed at the acceptance site on each six-car rake prior to Non-Regression Static testing at CMRL

S. No.	Part	Section	Clause No.	Original / Amended Bid Condition	Revised Bid Condition
30	Part 2	Section –VI A Chapter 20 – Software Management Requirements	20.4.6	<p>20.4.6 Software life cycles</p> <p>To control both quality and safety of the software, the Contractor shall implement the concept of the Double V-cycle which comprises:</p> <p>This V-cycle is detailed in the appendix of this document that illustrates the various steps of the software design and the software verification & validation. Each step is then detailed in a table. This is compliant with chapter 7 of EN 50128.</p> <p>The Contractor may propose a different software development lifecycle provided that a clear mapping between the adopted phases, including the combination of individual phases, and the phases defined in the appendix is given in the Software Quality Assurance Plan. Where phases are combined, then the Contractor shall ensure that all of the requirements for the individual phases are collectively met.</p> <p>i. The Development V-cycle. ii. The Safety V-cycle.</p> <p>Development V-cycle</p> <p>To control quality, the software shall be developed, verified and validated according to a strictly defined Development V-cycle. An overview of this V-cycle is given in the figure.</p> <p>This V-cycle is detailed in the appendix of this document that illustrates the various steps of the software design and software verification & validation. Each step is then detailed in a table. This is compliant with chapter 7 of EN 50128.</p> <p>The Contractor may propose a different software development lifecycle provided that a clear mapping between the adopted phases, including the combination of individual phases, and phases defined in the appendix is given in the Software Quality Assurance Plan. Where phases are combined, then the Contractor shall ensure that all of the requirements for individual phases are collectively met.</p> <p>Safety V-cycle</p> <p>To control safety, the software shall be designed, verified and validated according to a defined Safety V-cycle. An overview of this V-cycle is given in the figure shown.</p> <p>In parallel with the Development V-cycle followed by any software, the safety related software must also follow a Safety V-cycle as shown above. Therefore, the safety-related software must follow a Double V-cycle as shown.</p> <p>Thus, for each step of the Development V-cycle a safety step must be undertaken. This double V-cycle must be followed by the Contractor. The Contractor must ensure a strict independence between the Development team and the Safety team.</p> <p>The Contractor shall provide the CMRL with a Software Safety Plan describing the implemented Safety V-cycle and link with the Development V-cycle.</p> 	<p>Software life cycles</p> <p>To control both quality and safety of the software, the Contractor shall implement the concept of the Double V-cycle which comprises:</p> <p>This V-cycle is detailed in the appendix of this document that illustrates the various steps of the software design and the software verification & validation. Each step is then detailed in a table. This is compliant with chapter 7 of EN 50128.</p> <p>The Contractor may propose a different software development lifecycle provided that a clear mapping between the adopted phases, including the combination of individual phases, and the phases defined in the appendix is given in the Software Quality Assurance Plan. Where phases are combined, then the Contractor shall ensure that all of the requirements for the individual phases are collectively met.</p> <p>i. The Development V-cycle. ii. The Safety V-cycle.</p> <p>Development V-cycle</p> <p>To control quality, the software shall be developed, verified and validated according to a strictly defined Development V-cycle. An overview of this V-cycle is given in the figure.</p> <p>This V-cycle is detailed in the appendix of this document that illustrates the various steps of the software design and the software verification & validation. Each step is then detailed in a table. This is compliant with chapter 7 of EN 50128.</p> <p>The Contractor may propose a different software development lifecycle provided that a clear mapping between the adopted phases, including the combination of individual phases, and the phases defined in the appendix is given in the Software Quality Assurance Plan. 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31	Part 2	Section VI A APPENDIX – C	11 (Addendum No.1 Annexure 12)	DEPOT MACHINERY AND PLANT (DM&P) CONTRACTOR	11 DEPOT MACHINERY AND PLANT (DM&P) CONTRACTOR - replaced by Annexure (02) to Addendum No.2
32	Part 2	Section –VI A Appendix H – Deliverables List (Addendum No.1 Annexure 10)	-	Chapter 5 : Emergency Operator's Desk	Chapter 5 : Operator's Desk
33	Part 2	Section –VI A Appendix H – Deliverables List (Addendum No.1 Annexure 10)	-	PDR-5-1 - General Description of Emergency Operator's Desk PFDR-5-1 - Technical Description & Drawings of Emergency Operator's Desk FDR-5-1 - Product level Test Specification of Emergency Operator's Desk RPT-5-1 - Test Report of Emergency Operator's Desk	PDR-5-1 - General Description of Operator's Desk & Emergency Operator's Desk PFDR-5-1 - Technical Description & Drawings of Operator's Desk & Emergency Operator's Desk FDR-5-1 - Product level Test Specification of Operator's Desk & Emergency Operator's Desk RPT-5-1 - Test Report of Operator's Desk & Emergency Operator's Desk
34	Part 2	-	Addendum No.1 S.No. 412	In case of occurrence of below mentioned conditions during revenue operations, the specific train shall be withdrawn from service in ATO / UTO mode of operation (desired operation mode) or rescued by another train to clear the faulty train from passenger service. The below mentioned train withdrawal conditions shall be considered for reliability performance calculations as mentioned in Section VI A ERTS (RS) Chapter 18.6. Contractor shall suggest additional withdrawal conditions required to be added specific to the train design and shall be finalized during the design stage of contract execution.	Deleted

S. No.	Part	Section	Clause No.	Original / Amended Bid Condition	Revised Bid Condition																																																																		
35	Part 2	Section –VI B ERTS – DM&P	2.5.2	<p>Basic Parameters / features for the design of Battery-operated Rail cum Road Shunter (but not limited to)</p> <table border="1"> <thead> <tr> <th>S. No</th> <th>Parameter</th> <th>Details</th> </tr> </thead> <tbody> <tr> <td colspan="3" style="text-align: center;">Track Parameters</td> </tr> <tr> <td>1</td> <td>Track Gauge</td> <td>1435 mm (standard gauge)</td> </tr> <tr> <td>2</td> <td>Track Gradient*</td> <td>0.1%</td> </tr> <tr> <td>3</td> <td>Minimum curve radius*</td> <td>100 m</td> </tr> <tr> <td colspan="3" style="text-align: center;">BORRS Parameters</td> </tr> <tr> <td>1</td> <td>Shunter type</td> <td>Battery powered (Rail cum Road)</td> </tr> <tr> <td>2</td> <td>Tractive effort**</td> <td>35 kN minimum</td> </tr> <tr> <td>3</td> <td>Height of Shunter (on rail)</td> <td>3000mm max</td> </tr> <tr> <td>4</td> <td>Coupler</td> <td>Front and Rear (compatible to all type of Rolling stock)</td> </tr> <tr> <td>5</td> <td>Operational control</td> <td>Cabin and Radio remote</td> </tr> </tbody> </table> <p>* The above track data is indicative. The Contractor shall verify the track gradient, curve etc before to design & manufacture the shunters accordingly.**The minimum tractive efforts generated by the vehicle while shunting 6 car trains shall not be less than 35kN.</p>	S. No	Parameter	Details	Track Parameters			1	Track Gauge	1435 mm (standard gauge)	2	Track Gradient*	0.1%	3	Minimum curve radius*	100 m	BORRS Parameters			1	Shunter type	Battery powered (Rail cum Road)	2	Tractive effort**	35 kN minimum	3	Height of Shunter (on rail)	3000mm max	4	Coupler	Front and Rear (compatible to all type of Rolling stock)	5	Operational control	Cabin and Radio remote	<p>Basic Parameters / features for the design of Battery-operated Rail cum Road Shunter (but not limited to)</p> <table border="1"> <thead> <tr> <th>S. No</th> <th>Parameter</th> <th>Details</th> </tr> </thead> <tbody> <tr> <td colspan="3" style="text-align: center;">Track Parameters</td> </tr> <tr> <td>1</td> <td>Track Gauge</td> <td>1435 mm (standard gauge)</td> </tr> <tr> <td>2</td> <td>Track Gradient*</td> <td>4%</td> </tr> <tr> <td>3</td> <td>Minimum curve radius*</td> <td>100 m</td> </tr> <tr> <td colspan="3" style="text-align: center;">BORRS Parameters</td> </tr> <tr> <td>1</td> <td>Shunter type</td> <td>Battery powered (Rail cum Road)</td> </tr> <tr> <td>2</td> <td>Tractive effort**</td> <td>50 kN minimum</td> </tr> <tr> <td>3</td> <td>Height of Shunter (on rail)</td> <td>3000mm max</td> </tr> <tr> <td>4</td> <td>Coupler</td> <td>Front and Rear (compatible to all type of Rolling stock)</td> </tr> <tr> <td>5</td> <td>Operational control</td> <td>Cabin and Radio remote</td> </tr> </tbody> </table> <p>* The above track data is indicative. The Contractor shall verify the track gradient, curve etc before to design & manufacture the shunters accordingly.**The minimum tractive efforts generated by the vehicle while shunting 6 car trains shall not be less than 50kN.</p>	S. No	Parameter	Details	Track Parameters			1	Track Gauge	1435 mm (standard gauge)	2	Track Gradient*	4%	3	Minimum curve radius*	100 m	BORRS Parameters			1	Shunter type	Battery powered (Rail cum Road)	2	Tractive effort**	50 kN minimum	3	Height of Shunter (on rail)	3000mm max	4	Coupler	Front and Rear (compatible to all type of Rolling stock)	5	Operational control	Cabin and Radio remote
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5.15 CERTIFICATE CONFIRMING MINIMUM LOCAL CONTENT

We hereby jointly and severally certify in accordance with clause '9.a' of the Order no. P- 45021 / 2 / 2017 - PP (BE-II) - Part (4) Vol. II of Ministry of Commerce and Industry, Department of Promotion of Industry and Internal Trade (DPIIT) {formerly Department of Industrial Policy and Promotion (DIPP)}, Government of India dated 19 July 2024 that the item(s) offered meets the Minimum Local Content (MLC) of

- | | | |
|---|---|---|
| (i) 60% (For Class I Local Supplier) | } | Strike off whichever is not applicable. |
| (ii) 20% (For Class II Local Suppliers) | | |
| (iii) < 20% (For Non-Local Suppliers) | | |

(60% MLC (derived on Total Contract Price) as specified in MoHUA Order No. K – 14011 / 08 / 2017 / MRTS – Coord dated 14th October 2020). The details including name of proposed vendor(s), location(s) at which the local value addition is made, and percentage of local content will be provided within 15 days of issue of LoA.

We acknowledge that false declaration by the tenderer regarding local value addition including payments to be made to their vendors for local value addition shall be treated as a fraudulent practice under this tender for which the tenderer or its successor can be debarred for a period up to three years along with such other actions as may be permissible under the law.

In case of procurement for a value in excess of Rs. 10 crores, we also undertake to submit a certificate from statutory auditor or cost auditor of the company (in the case of companies) or from a practicing cost accountant or practicing chartered accountant (in respect of suppliers other than companies) giving the percentage of local content, in accordance with clause '9.b' of the Order no. P – 45021 / 2 / 2017 - PP (BE – II) of Ministry of Commerce and Industry, Department for Promotion of Industry and Internal Trade (DPIIT) {formerly Department of Industrial Policy and Promotion (DIPP)}, Government of India dated 16th September 2020 or latest order, after completion of works to the Engineer.

Signature of the Bidder

11. DEPOT MACHINERY AND PLANT (DM&P) CONTRACTOR

11.1. General

- 11.1.1. This section describes the interface requirements between Rolling Stock (RS) Contract and the Depot Machinery & Plant (DM&P) Contractors for each of the Designated Depot(s).
- 11.1.2. Depot M&P systems are available in each of the Designated Depot(s). It is therefore multiple designated Contractors with whom the RS Contractor must manage interfaces for Depot M&P Assets. However, Rolling Stock contractor is responsible for Depot Machinery & Plant procured under this contract including for its interfacing.
- 11.1.3. The Contractors shall ensure that all the requirements of the Metro Railway General Rules are duly met by incorporating appropriate alarms, remote commands and other features
- 11.1.4. The Contractors as above shall ensure that all requirements of the Specification pertaining to interfaces are properly satisfied.
- 11.1.5. All Interface Meetings, unless specifically approved by CMRL shall be held at site and they shall be given sufficient notice to attend the meeting.
- 11.1.6. Each Contractor shall be responsible for interface identification, establishment, construction and testing works either in the capacity as the Lead Contractor or Participating Contractor.

11.2. Interface Management

- 11.2.1. DM&P Contractor shall be the Lead Contractor. The Lead Contractor will be responsible to initiate, plan, coordinate and produce jointly with the Participating Contractors all the required interfaces and interface design documents and interface progress reports for submission to CMRL for acceptance. The Lead Contractor will also prepare and issue all interface meeting minutes after incorporating RS Contractors comments within 3 days of the meeting and provide biweekly interface progress reports to all the participating Contractors for information. Later, forwarding of issued minutes of meeting and biweekly interface progress reports to respective Engineers shall be responsibility of concerned Contractors.
- 11.2.2. RS Contractor will be participating Contractors. The Participating Contractors shall collaborate fully with the Lead Contractor in the development and finalization of the interface design, joint production of the interface documents and interface progress reports.
- 11.2.3. All the participating Contractors shall ensure that copy of the Interface design documents submitted to CMRL of the RS Contractor shall also be submitted to the concerned team (will be intimated by CMRL) to participate in the Interface Meetings.
- 11.2.4. The costs for all interface design and testing works shall be deemed to be included in the Contract sum regardless of the actual extent of effort required or expended by the Contractor.
- 11.2.5. The Contractors shall be fully responsible for the management and control of his sub-contractors in relation to all interfacing activities carried out under the Contract.
- 11.2.6. RS Contractor shall provide necessary support to resolve all pending or new interface related issues arising during the operation of the trains till completion of DDC Contractor defect liability period. DDC Contractor shall provide necessary support to resolve all pending or new interface related issues arising during the operation of trains till completion of RS Contractor defect liability period.

11.3. Integrated Testing and Commissioning:

- 11.3.1. RS & DM&P Contractors shall perform Integrated Testing.
- 11.3.2. Both Contractors shall jointly produce a protocol document for Integrated Testing and Commissioning which shall be submitted for CMRL review and approval.

11.4. INTERFACE- Division of Responsibility

- 11.4.1. RS Contractor shall provide necessary details as required by DM&P Contractor and vice-versa. These shall include but not limited to the following:

Item	DM&P Contractor	RS Contractor
1. Auto Train Wash Plant (ATWP)	a. Shall collect all relevant details i.e train dimensions (Front to Rear end including coupler) etc of RS for the effective design of Wash plant.	a. Shall provide details of RS dimensions as relevant to the design of Wash plant.
	b. Shall collect all relevant information and details of type of detergent and water suitable for RS with a view to avoid any damage to RS surface and design the Wash plant accordingly	b. Shall provide all relevant information and details regarding type of detergent and water suitable for the RS material with other instructions as relevant.
	c. Shall obtain any specific instruction	c. Shall provide specific details e.g infringement objects if any which may hindrance to the washing etc.
	d. Shall conduct joint test with RS Contractor that the wash plant is adapted and compliant to RS requirement.	d. Shall attend and provide necessary support to DM&P Contractor during wash plant testing and commissioning as necessary.
2. Battery Operated Railroad Shunter (BORRS)	a. Shall collect all relevant details regarding RS characteristics including weight for the effective design of BORRS	a. Shall provide all relevant details regarding RS characteristics including weight, dimensions etc.
	b. Shall collect all relevant information and details of type of coupler of RS and design/provide the BORRS coupler with compatibility accordingly.	b. Shall provide all relevant information and details of type of coupler of RS.
	c. Shall demonstrate the testing and commissioning with coupling / uncoupling, shunting with 6 coupled car, braking with and without shunting load etc as per tender requirement.	c. Shall attend and provide necessary support to DM&P Contractor during BORRS testing and commissioning as necessary.

Item	DM&P Contractor	RS Contractor
3. Synchronised Pit Jacks (SPJ)	a. Shall collect all relevant details regarding RS characteristics including weight, dimensions, lifting pad location and dimension, Bogie wheelbase, Bogie centre to centre, wheel profile etc for the effective design of Pit Jacks.	a. Shall provide all relevant details regarding RS characteristics including weight, dimensions, lifting pad location and dimension, Bogie wheel base, Bogie centre to centre, wheel profile etc
	b. Shall manufacture the equipment ensuring no infringement in the vertical plane below the lifting points.	b. Shall coordinate with Jacks Contractor to provide specific details as required.
	c. Shall demonstrate the testing and commissioning with lifting / lowering / holding etc as per tender with RS 6 car configuration.	c. Shall attend and provide necessary support to DM&P Contractor during Jacks testing and commissioning as necessary.
4. Synchronised Mobile Lifting Jacks (SMPJ) and Car Body Stands	a. Shall collect all relevant details regarding RS characteristics including weight, dimensions, lifting pad location and dimension etc for the effective design of Mobile Jacks and Car body stands.	a. Shall provide all relevant details regarding RS characteristics including weight, dimensions, lifting pad location and dimension etc.
	b. Shall manufacture the equipment ensuring no infringement in the vertical plane below the lifting points.	b. Shall coordinate with Jack and car body stand Contractor to provide specific details as required.
	c. Shall demonstrate the testing and commissioning of jacks with lifting / lowering / holding etc as per 6 RS car configuration.	c. Shall attend and provide necessary support to DM&P Contractor during Jack and car body stand testing and commissioning as necessary.
5. Under floor Wheel Lathe (UFWL)	a. Shall collect the required design related data for Bogie, wheel profile and all relevant information	a. Shall provide the required design related data for Bogie, wheel profile and all relevant information to DM&P Contractor.
	b. Shall take into account RS specification and detailed parameters for designing machine.	b. Shall furnish to DM&P Contractor, all along the design stage, any update, accurate details to enable him to finalise the machine design.
	c. Shall manufacture the equipment ensuring no infringement of bogie component and shunter underframe component which may cause hindrance during rollover, profiling etc.	c. Shall coordinate with DM&P Contractor to provide and confirm specific details as required.

Item	DM&P Contractor	RS Contractor
	d. Shall demonstrate the testing and commissioning as per tender requirement.	d. Shall attend and provide necessary support to DM&P Contractor during Wheel lathe testing and commissioning as necessary.
6. Diesel Operated Relief and Rescue vehicle (RRV)with Re-railing and Rescue devices	a. Shall collect all relevant details regarding RS characteristics including weight, dimensions for the effective design of RRV.	a. Shall provide all relevant details regarding RS characteristics including weight, dimensions etc.
	b. Shall collect all relevant information and details of type of coupler of RS and provide the RRV coupler with compatibility accordingly.	b. Shall provide all relevant information and details of type of coupler of RS.
	c. Shall demonstrate the testing and commissioning of RRV coupling and uncoupling test with RS, shunting upto 3/6 coupled car with RRV (pulling and pushing), braking etc.	c. Shall attend and provide necessary support to DM&P Contractor during testing and commissioning as necessary.
	d. Shall demonstrate the testing and commissioning of all Re-railing and Rescue devices with and without RS as decided by Engineer/Employer at agreed site/location.	d. Shall attend and provide necessary support to DM&P Contractor during testing and commissioning as necessary.
7. Bogie Turn Table (BTT)	a. Shall collect all relevant details regarding RS weight, bogie weight, Bogie dimensions, wheel profile etc of all types of Bogies for the effective design of BTTs and manufacture the BTTs accordingly.	a. Shall provide all relevant details regarding RS weight, bogie weight, Bogie dimensions, wheel profile etc
	b. Shall demonstrate the testing and commissioning of BTTs turning with and without bogie, alignment of BTTs after locking, rollover of train etc as decided by Engineer/ Employer.	b. Shall attend and provide necessary support to DM&P Contractor during testing and commissioning as necessary.
8. Bogie Manipulator (BFM)	a. Shall collect all relevant details for all types of bogies weight, Bogie dimensions (with wheel and without wheel) and frame weight and dimensions, etc for all types of bogies for the effective design of machine and manufacture the machine accordingly.	a. Shall provide all relevant details regarding bogie weight, Bogie dimensions (with wheel and without wheel) and frame weight and dimensions, etc.
	b. Shall demonstrate the testing and commissioning of BTTs turning with and without bogie, alignment of BTTs after locking, rollover of train etc as decided by Engineer/ Employer.	b. Shall attend and provide necessary support to DM&P Contractor during testing and commissioning as necessary.

Item	DM&P Contractor	RS Contractor
9. Bogie Testing Unit (BTU)	a. Shall collect all relevant details regarding bogie weight, dimensions, wheel profile, height etc of all types of Bogies for the effective design of BTU and manufacture the BTU accordingly.	a. Shall provide all relevant details regarding bogie weight, dimensions, wheel profile, height etc
	b. Shall demonstrate the testing and commissioning of BTU with bogie.	b. Shall attend and provide necessary support to DM&P Contractor during testing and commissioning as necessary.
10. TTCV	a. Shall collect all relevant information and details of type of coupler of RS and provide the TTCV coupler with compatibility accordingly.	a. Shall provide all relevant information and details of type of coupler of RS.
11. Driver Desk Simulator	a. Shall collect all relevant information and details including desk control, other controls etc of RS and design the simulator accordingly.	a. Shall provide all relevant information and details of RS desk control and other details required to design the Simulator.
12. Maintenance Desk Simulator	a. Shall collect all relevant information and details RS and its subsystem to design the simulator accordingly.	a. Shall provide all relevant information and details of RS and its subsystem required to design the Maintenance Simulator.
13. General	a. DM&P Contractor shall ensure all the interface requirements pertaining to RS Contractor are shared and agreed mutually.	a. RS Contractor shall ensure all the interface requirements pertaining to DM&P Contractor are shared and agreed mutually.
	b. DM&P Contractor shall prepare Detailed Interface document (DID) and shall ensure that it covers Design, Interface Hazard log, Construction, Testing & Commissioning, Test report formats, Maintenance as applicable.	b. RS Contractor shall provide the necessary information and support as requested by DM&P Contractor.