

Chennai Metro Rail Limited
Tender Description: Design, Manufacture, Supply, Testing, Commissioning of Standard Gauge Metro Rolling Stock (210 cars) and Training of Personnel
Tender No. CMRL/PHASE II/SYS/CP26/ARE02/2021
Tender ID. 2021_CMMDB_640237_1

Addendum No.03

Sl. No.	Part/ Section No.	Clause No.	Original Clause	Revised Clause																																					
1	Part 1 : Sec III	EQC 2.5 Sl. NO. 1	Minimum of 105 cars of similar standard gauge with wheel mounted or Axle mounted Disc brakes or tread brake bogies as proposed for this bid should have been designed, manufactured and commissioned in the last ten years starting 01-01-2011 and at least 53 cars with the similar bogies should have been supplied and proven in service for a period of five years or more in a country other than the country of origin of manufacturer.	Minimum of 105 cars of similar standard gauge with wheel mounted or Axle mounted Disc brakes or tread brake bogies as proposed for this bid should have been designed, manufactured and commissioned in the last ten years starting 01-01-2011 and at least 53 cars with the similar bogies should have been supplied and proven in service for a period of five years or more.																																					
2	Part 1 : Sec III	EQC 2.6	Establishment of manufacturing facility in India: The successful bidder shall ensure that 75% of the quantity ordered in this bid is achieved by establishing metro cars manufacturing facility in India to manufacture or utilize existing Rolling Stock manufacturing facility for assembly works. The contractor shall provide declaration through the Form Manufacturing Facility that he will establish a manufacturing facility in India to manufacture or utilize existing Rolling Stock manufacturing facility for assembly works at least 75% of the total ordered quantity.	Establishment of manufacturing facility in India: The successful bidder shall ensure that 75% of the quantity ordered in this bid is achieved by establishing / established metro cars manufacturing facility in India to manufacture or utilize existing Rolling Stock manufacturing facility in India for assembly works. The contractor shall provide declaration through the Form Manufacturing Facility that he will establish / established manufacturing facility in India to manufacture or utilize existing Rolling Stock manufacturing facility in India for assembly works 75% of the total ordered quantity.																																					
3	Part 1: Sec IV	2 Table A	Legend: RBI – Reserve Bank of India Note : in case if the bidder fills in weightages whose sum is not equal to 0.67 (excluding Nonadjustable), then CMRL will adjust the indices on pro-rata basis based on bidder's submission. Price adjustment shall be calculated as per the above table and as per sub-clause 3.2 of 'Section IV – Bidding Forms – Instructions for completing the pricing document'	Legend: RBI – Reserve Bank of India Price adjustment shall be calculated as per the above table and as per Cl. 3.2 of "Part 1 – Bidding Forms – Instructions for Completing the Pricing document". Note: a) Bidder shall quote the applicable weightage/co-efficient against each components listed above within the range specified therein and the sum-total of all the components (including Non-adjustable (Fixed) component) shall be equal to 1 (100%). Bidder shall upload the filled in 'Schedule of adjustment data' along with their Price bid. b) In case if the Bidder fills in weightages which are not within the range specified, CMRL will adjust the weightage according to the limits of the range specified. c) In case if the bidder fills in weightages whose sum is not equal to 0.67 (excluding Nonadjustable), then CMRL will adjust the indices on prorata basis based on bidder's submission.																																					
4	Part 1: Sec IV	2 Table B	Note : in case if the bidder fills in weightages whose sum is not equal to 0.67 (excluding Nonadjustable), then CMRL will adjust the indices on pro-rata basis based on bidder's submission. Price adjustment shall be calculated as per the above table and as per sub-clause 3.2 of 'Section IV – Bidding Forms – Instructions for completing the pricing document'.	Price adjustment shall be calculated as per the above table and as per Cl. 3.2 of "Part 1 – Bidding Forms – Instructions for Completing the Pricing document". Note: a) Bidder shall quote the applicable weightage/co-efficient against each components listed above within the range specified therein and the sum-total of all the components (including Non-adjustable (Fixed) component) shall be equal to 1 (100%). Bidder shall upload the filled in 'Schedule of adjustment data' along with their Price bid. b) In case if the Bidder fills in weightages which are not within the range specified, CMRL will adjust the weightage according to the limits of the range specified. c) In case if the bidder fills in weightages whose sum is not equal to 0.67 (excluding Nonadjustable), then CMRL will adjust the indices on prorata basis based on bidder's submission.																																					
5	Part 1: Sec IV	2 Table C		<p style="text-align: center;">Table C. Foreign Currency (FC2)</p> <table border="1" style="width: 100%; border-collapse: collapse;"> <thead> <tr> <th>(i) Index Code</th> <th>(ii) Index Description</th> <th>(iii) Source of Index</th> <th>(iv) Base value and date</th> <th>(v) Weightage</th> </tr> </thead> <tbody> <tr> <td></td> <td>Non-adjustable (Fixed)</td> <td>—</td> <td>—</td> <td>0.33</td> </tr> <tr> <td>L_n/L₀</td> <td>Labour</td> <td>All India Consumer Price Index for Industrial Workers Published by RBI Bulletin</td> <td rowspan="4" style="text-align: center;">Value as on 28 days prior to last date of bid submission</td> <td>0.10 – 0.25</td> </tr> <tr> <td>S_n/S₀</td> <td>Stainless steel</td> <td>CRU</td> <td>0.15 – 0.25</td> </tr> <tr> <td>A_n/A₀</td> <td>Aluminium</td> <td>ALCOA</td> <td>0.10 – 0.30</td> </tr> <tr> <td>F_n/F₀</td> <td>Carbon Steel</td> <td>CRUspi</td> <td>0.04 – 0.10</td> </tr> <tr> <td>C_n/C₀</td> <td>Copper</td> <td>LME</td> <td></td> <td></td> </tr> <tr> <td colspan="4" style="text-align: right;">Total</td> <td>1.00</td> </tr> </tbody> </table> <p>Price Adjustment shall be calculated as per the above table and as per Cl. 3.2 of "Part 1 – Bidding Forms – Instructions for Completing the Pricing document".</p> <p>Note: a) Bidder shall quote the applicable weightage/co-efficient against each components listed above within the range specified therein and the sum-total of all the components (including Non-adjustable (Fixed) component) shall be equal to 1 (100%). Bidder shall upload the filled in 'Schedule of adjustment data' along with their Price bid. b) In case if the Bidder fills in weightages which are not within the range specified, CMRL will adjust the weightage according to the limits of the range specified. c) In case if the bidder fills in weightages whose sum is not equal to 0.67 (excluding Nonadjustable), then CMRL will adjust the indices on prorata basis based on bidder's submission.</p>	(i) Index Code	(ii) Index Description	(iii) Source of Index	(iv) Base value and date	(v) Weightage		Non-adjustable (Fixed)	—	—	0.33	L _n /L ₀	Labour	All India Consumer Price Index for Industrial Workers Published by RBI Bulletin	Value as on 28 days prior to last date of bid submission	0.10 – 0.25	S _n /S ₀	Stainless steel	CRU	0.15 – 0.25	A _n /A ₀	Aluminium	ALCOA	0.10 – 0.30	F _n /F ₀	Carbon Steel	CRUspi	0.04 – 0.10	C _n /C ₀	Copper	LME			Total				1.00
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6	Part 1 : Sec IV	BF 4.2		New Clause : 4.2.25 : Not Used. 4.2.26 : Not Used.																																					
7	Part 1 : Sec IV	BF Form Manufacturing Facility	We((Name of the Bidder)hereby declare that, we will construct metro cars manufacturing facility in India to manufacture at least 75% of the quantity ordered in this tender either through collaboration with companies based in India or by setting up an independent manufacturing unit in India	We((Name of the Bidder) hereby declare that we will ensure that 75% of the Ordered quantity in this bid is achieved by establishing metro cars manufacturing facility in India to manufacture the Rolling Stock. Or We((Name of the Bidder) hereby declare that we will ensure that 75% of the Ordered quantity in this bid is achieved by utilising established metro cars manufacturing facility in India for assembly works.																																					
8	Part 2: Sec VI	1.3.6	The at-grade, underground and elevated sections have ballast less track in mainline and Ballasted track in in depots. The cars shall be designed to meet the performance requirement given in ERTS Section 2.14 of this specification. The track gauge is 1435mm.	The at-grade, underground, Madhavaram Depot and elevated sections have ballast less track and Ballasted track in Poonamalle depot. The cars shall be designed to meet the performance requirement given in ERTS Section 2.14 of this specification. The track gauge is 1435mm.																																					

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10	Part 2: Sec VI	Table 2-4 Track Tolerances	Description: Gauge (Maintenance) - >500m radius (with respect to 1435 mm) Ballasted: -10mm to -20mm over widened gaug Ballast-less (DFF): -10 to +20mm over widened gauge	Description: Gauge (Maintenance) - >500m radius (with respect to 1435 mm) Ballasted: -10mm to +20mm over widened gaug Ballast-less (DFF): -10 to +20mm over widened gauge
12	Part 2: Sec VI	Table 2-11 Maximum Wayside Noise Levels	Condition: All systems operating simultaneously, including air conditioning and propulsion cooling system, rake stationary Maximum Level of Exterior Noise in dBA @ 7.5m from center of track on either sides: 67 dBA at 1.5m	Condition: All systems operating simultaneously, including air conditioning and propulsion cooling system, rake stationary Maximum Level of Exterior Noise in dBA @ 7.5m from center of track on either sides: 67 dBA at 7.5m
13	Part 2: Sec VI	2.15.9.7	2.15.9.7 The correction of slide shall act independently on each axle basis. The system shall be fully adaptive to varying adhesion conditions to maximise the use of the available adhesion level at every axle	2.15.9.7 The correction of slide shall act independently on each axle basis. The system shall be fully adaptive to varying adhesion conditions to maximise the use of the available adhesion level at every individual axle.
14	Part 2: Sec VI	2.15.9.8	2.15.9.8 If wheel spin is detected in any individual axle basis, the traction equipment shall reduce power to the concerned motors of the axle. When wheel spin is corrected in any individual axle traction power shall be gradually increased to meet performance requirements per axle basis.	2.15.9.8 If wheel spin is detected in any individual axle basis, the traction equipment shall reduce power to the concerned specific motors of the axle. When wheel spin is corrected in any individual axle traction power shall be gradually increased to meet performance requirements per axle basis.
15	Part 2: Sec VI	2.17.3.9	Door Operation Noise produced by simultaneous operation of all saloon doors on one side of the car shall not exceed 75dBA 72dBA during the sliding operation and 75dBA for the locking/unlocking, measured on the fast meter scale. This should be measured at all points in the car 300mm from the doors and 1000mm above the floor during train stationary condition.	Door Operation Noise produced by simultaneous operation of all saloon doors on one side of the car shall not exceed 72dBA during the sliding operation and 75dBA for the locking/unlocking, measured on the fast meter scale. This should be measured at all points in the car 300mm from the doors and 1000mm above the floor during train stationary condition.
16	Part 2: Sec VI	2.26.1.iv	The train shall be designed to prevent fire propagation through the use of fire barriers in the floor, and in walls at the sides and ends and fire-resistant equipment housings. Flammable materials shall be well contained with IP 65 protection. The vehicle floor shall provide a fire barrier of 30 minutes duration tested in accordance with EN45545 Part 1 to 7 (Category 4-A, Hazard level HL3) latest editions or better equivalent standard.	The train shall be designed to prevent fire propagation through the use of fire barriers in the floor, and in walls at the sides and ends and fire-resistant equipment housings. The vehicle floor shall provide a fire barrier of 30 minutes duration tested in accordance with EN45545 Part 1 to 7 (Category 4-A, Hazard level HL3) latest editions or better equivalent standard
17	Part 2: Sec VI	3.2	The car structure material shall be Stainless Steel or Aluminum. Stainless steel shall conform to ASTM GR 301L or equivalent. Aluminum shall conform to ALCOA Specification or Equivalent International standards Covering Use of Aluminum in Passenger Carrying Railroad Vehicles Aluminum Association Aluminum Standards and Data. The end under frame may be constructed of LAHT steel to satisfy the strength requirements. Collision posts (if used) may be of stainless steel or LAHT steel to satisfy the strength requirements.	The car structure material shall be Stainless Steel or Aluminum. Stainless steel shall conform to ASTM GR 301L or equivalent. Aluminum shall conform to ALCOA Specification or Equivalent International standards Covering Use of Aluminum in Passenger Carrying Railroad Vehicles Aluminum Association Aluminum Standards and Data. The end under frame may be constructed of LAHT steel to satisfy the strength requirements. Collision posts (if used) may be of stainless steel or LAHT steel to satisfy the strength requirements.
18	Part 2: Sec VI	3.13.14	Alternatively, if an aluminum carshell is offered the contractor shall proposed propose different combination of Aluminum alloy to fully meet all the strength and load conditions as in Employer Requirements Technical Specification, for approval by CMRL construction for metro railcars.	Alternatively, if an aluminum carshell is offered the contractor shall propose different combination of Aluminum alloy to fully meet all the strength and load conditions as in Employer Requirements Technical Specification, for approval by CMRL.
19	Part 2: Sec VI	5.3.3	5.3.3 The Operator's seating area, standing area and control arrangements shall permit the operator to carry out train operation tasks from both seating & standing position only.	5.3.3 The Operator's seating area, standing area and control arrangements shall permit theoperator to carry out train operation tasks from both seating & standing position.
20	Part 2: Sec VI	5.5.7	FORWARD - ISOLATED MANUAL: The Train shall be capable of being driven manually in the forward direction up to a speed limited by the TCMS and traction control unit of train, i.e. 25 Kmph in Depot and 40 Kmph in Mainline during non-supervision condition of signaling system (Safety cutout mode). During this condition, the traction control unit of train shall shall cut-out the traction and BECU shall apply Full Service Brake if the permitted speeds are exceeded.	FORWARD - ISOLATED MANUAL: The Train shall be capable of being driven manually in the forward direction up to a speed limited by the TCMS and traction control unit of train, i.e. 25 Kmph in Depot and 40 Kmph in Mainline during non-supervision condition of signaling system (Safety cutout mode). During this condition, the traction control unit of train shall cut-out the traction and BECU shall apply Full Service Brake if the permitted speeds are exceeded.
21	Part 2: Sec VI	7.3.11	7.3.11 "All airways handling conditioned air and airways handling air to be conditioned, shall be separately ducted. The air ducts handling conditioned air shall adequate heat insulation layers. Temperature variations inside saloon room shall follow EN 14750 standards.	7.3.11 "All airways handling conditioned air and airways handling air to be conditioned, shall be separately ducted. The air ducts handling conditioned air shall have adequate heat insulation layers. Temperature variations inside saloon room shall follow EN 14750 standards
22	Part 2: Sec VI	7.6.2.i.		i. Not used
23	Part 2: Sec VI	9.3.8	9.3.8 The design and installation of the auxiliary converter inverter shall ensure continuous operation of the auxiliary supplies, not with-standing any interruption to the 25 KV main traction supply on any section. The Contractor shall submit calculations to verify auxiliary electrical system's failed-train rescue capability. (CDRL 9-3)	9.3.8 The design and installation of the auxiliary converter inverter shall ensure continuous operation of the auxiliary supplies, not with-standing any interruption to the 25 KV main traction supply on any live section. The Contractor shall submit calculations to verify auxiliary electrical system's failed-train rescue capability. (CDRL 9-3)
24	Part 2: Sec VI	10.3.4	A pantograph auto-drop function which shall drop the pantograph automatically when excessive height is detected shall be provided. An indication shall be provided to the train and RSC consoles of OCC, BCC & DCC when this function has been operated. During pantograph entanglement with OHE catenary, there shall be an indication to the train operator and RSC consoles of OCC, BCC & DCC.	A pantograph auto-drop function which shall drop the pantograph automatically when excessive height is detected shall be provided. An indication shall be provided to the train operator and RSC consoles of OCC, BCC & DCC when this function has been operated. During pantograph entanglement with OHE catenary, there shall be an indication to the train operator and RSC consoles of OCC, BCC & DCC.
25	Part 2: Sec VI	11.2.7	The bogie systems shall safely function at all speeds up to and including the safe design speed as defined in ERTS clause 2.14.1 without any loss of stability, under all conditions of track and wheel and car wear on the system as defined in ERTS Section 2	The bogie systems shall safely function at all speeds up to and including the safe design speed as defined in ERTS clause 2.14.1 without any loss of stability, under all conditions of track and wheel wear on the system as defined in ERTS Section 2
26	Part 2: Sec VI	11.4.13.5	11.4.13.5 The Contractor shall submit a proposal covering the scope of the analysis and the model for review by CMRL The maximum values of acceleration measured at central pivot level are: a. Vertical acceleration 0.27g b. Lateral acceleration 0.27g The contractor shall submit calculations to confirm that ride index lateral and vertical shall not exceed 2.75 under all normal operating conditions for under allnormal operating conditions for worn-out cars track conditions. (CDRL 11-7)	11.4.13.5 The Contractor shall submit a proposal covering the scope of the analysis and themodel for review by CMRL. The maximum values of acceleration measured at central pivot level are: a. Vertical acceleration 0.27g b. Lateral acceleration 0.27g The contractor shall submit calculations to confirm that ride index lateral and vertical shall not exceed 2.75 under all normal operating conditions for worn-out cars operated on run down track conditions (CDRL 11-7)
27	Part 2: Sec VI	13.4.3.f		f. Not used
28	Part 2: Sec VI	13.13.6	13.13.6 All the interior and exterior cameras shall support for a video resolution of 1920x1080 HD and minimum 30 frames per second, minimum illumination of 0.3 lux (color), iris control, minimum 90 dB wide dynamic range (WDR) and Power Over Ethernet (POE) compliant. Cameras shall be of proven design in railway applications. The recordings from these cameras must be clear in dark, daytime, night-time and in all hours of operation even in case of non-availability of any exterior lighting. All the train cameras shall be Infra-red type or latest better type. Camera and Recorder sw shall comply CCTV Industry standards like onvif	13.13.6 All the interior and exterior cameras shall support for a video resolution of minimum 1920x1080 HD and minimum 30 frames per second, minimum illumination of 0.3 lux (color), iris control, minimum 90 dB wide dynamic range (WDR) and Power Over Ethernet (POE) compliant. Cameras shall be of proven design in railway applications. The recordings from these cameras must be clear in dark, daytime, night-time and in all hours of operation even in case of non-availability of any exterior lighting. All the train cameras shall be Infra-red type or latest better type. Camera and Recorder sw shall comply CCTV Industry standards like onvif
29	Part 2: Sec VI	13.13.10	13.13.10 Provision shall be available on demand to remotely view live OCC, BCC, DCCs and in SCR live CCTV streaming directly from Cameras / NVR recordings of any train as per ERTS clause 13.13.7. Necessary CCTV display devices in (OCC, BCC, DCCs and in SCR) for this function shall be provided by the Telecommunications contractor. Provision shall be available to live stream, play-back download video recordings of any train from a single point in the OCC, BCC & DCCs. Necessary software for remote downloading of CCTV video recordings shall be provided to CMRL RS division. RS contractor shall interface with the Telecom contractor as per Appendix C requirements.	Provision shall be available on demand to remotely view live OCC, BCC, DCCs and in SCR live CCTV streaming directly from Cameras / NVR recordings of any train as per ERTS clause 13.13.7. Necessary CCTV display devices in (OCC, BCC, DCCs and in SCR) for this function shall be provided by the STC contractor. Provision shall be available to live stream, play-back download video recordings of any train from a single point in the OCC, BCC & DCCs. Necessary software for remote downloading of CCTV video recordings shall be provided to CMRL RS division. RS contractor shall interface with the Telecom contractor as per Appendix C requirements.
30	Part 2: Sec VI	14.10.6.2	14.10.6.2 Deleted	14.10.6.2 The Contractor shall supply one event recorder for each train, easily removable, mounted in a car in an approved location. a) Deleted. b) Capacity: The recorder shall have the provision of recording at least 200 signals of the data which should be easily retrievable either by directly connecting the Window based PC or/and the storage media shall be removable type. The event recorder shall maintain a record of monitored signals and parameters in its internal memory. The memory shall be nonvolatile such that the contents will not be lost in case of battery failure/low voltage power supply failure and shall be sufficiently large to ensure that signals for at least 3 months of operation will be kept on record for storage before being overwritten in First-In-First-Out (FIFO) method. The use of processed data shall be minimized. c) Integrity: The Recorder shall be fully protected against illegal tampering, shall maintain its structural integrity and integrity/retrieval of data/device during accident.
31	Part 2: Sec VI	16.3.2.c.	c. A description of the duties and responsibilities of each key staff member	c. A description of the duties and responsibilities of each key staff member. The scope of responsibilities of each staff and the reporting lines between individual staff. The documents that each staff is authorized to sign on behalf of the Contractor

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32	Part 2: Sec VI	16.3.2.e, f & g	e. A description of the methodology to be used to track and control program progress against the program schedule. f. Master Program Schedule as described in ERTS16.6.	e. Each member in the Contractor's Staffing Proposal, including the Key Personal and the Specially Required shall be Noticed to CMRL. They shall be allocated to this Contract on a full-time basis, until the activities that he is responsible for have already been completed or have to be carried out off-site. Should it be necessary to replace any staff before the activities he is responsible for have been carried out, the Contractor shall submit the CV of the proposed substitute to CMRL Notice of No Objection, at least 30 days before the proposed change. The substitute shall not be less qualified or experienced than the person he is replacing. f. A description of the methodology to be used to track and control program progress against the program schedule. g. Master Program Schedule as described in ERTS16.6.
33	Part 2: Sec VI	16.4.4.b	b. Engineering Manager/System Integration Manager – with responsibility for coordination between design, manufacturing, project implementation and for integration of systems both internal and external to the car. This person will be responsible for the areas defined in ERTS 16.9	b. Engineering Manager / System Integration Manager – with responsibility for coordination between design, manufacturing, project implementation and for integration of systems both internal and external to the car. This person will be responsible for the areas defined in ERTS 16.9. He shall be made available in the CMRL depot premises within 28 days of the commencement of project works until defect notification period of last train.
34	Part 2: Sec VI	16.4.4.c	c. Interface Manager – with responsibility as defined in ERTS section 16.16. Interface manager shall be available at depot project site from the initial preliminary design stage until the completion of defect notification period of last train.	Interface Manager – with responsibility as defined in ERTS section 16.16. Interface manager shall be available at depot project site within 28 days of the commencement of project works until the completion of defect notification period of last train.
35	Part 2: Sec VI	16.4.4.d	d. Chief Maintenance Manager – with responsibility of developing the maintenance strategy and shall be in-charge of all the preventive and corrective maintenance activities until the completion of defect notification period of last train. Shall be positioned in CMRL maintenance depots where the project trains are maintained	d. Chief Maintenance Manager – with responsibility of developing the maintenance strategy and shall be in-charge of all the preventive and corrective maintenance activities until the completion of defect notification period of last train. Shall be positioned in CMRL maintenance depots (before 6 months of Prototype trains arrival) where the project trains are maintained.
36	Part 2: Sec VI	16.4.4.e	e. Project Quality Manager – with the responsibility to adhere all the aspects of Project Quality Plan for all the trains in manufacturing plant and in depot sites. Shall be responsible for the quality validation of all the modifications done in train during the commissioning and warranty phases until defect notification period of last train. Shall be positioned in CMRL maintenance depots where the project trains are commissioned and maintained.	e. Project Quality Manager – with the responsibility to adhere all the aspects of Project Quality Plan for all the trains in manufacturing plant and in depot sites. Shall be responsible for the quality validation of all the modifications done in train during the commissioning and warranty phases until defect notification period of last train. Shall be positioned in CMRL maintenance depots (within 28 days of the commencement of project works) where the project trains are commissioned and maintained.
37	Part 2: Sec VI	16.4.4.f	f. Project OSHE Manager – with the responsibility to adhere all the aspects of Project Safety Plan for all the trains in depot sites. Shall be responsible for all Safety Health and Environment prepare OSHE audit score report, inspection reports, procedures, plan etc., during project execution phase including commissioning and warranty phase and until defect notification period of last train. Shall be positioned in CMRL site.	f. Project OSHE Manager – with the responsibility to adhere all the aspects of Project Safety Plan for all the trains in depot sites. Shall be responsible for all and Environment prepare OSHE audit score report, inspection reports, procedures, plan etc., during project execution phase including commissioning and warranty phase and until defect notification period of last train. Shall be positioned in CMRL site (before 6 months of Prototype trains arrival)
38	Part 2: Sec VI	16.4.4.g	g. Testing and Commissioning Manager - with the responsibility of testing and commissioning of all the trains in depots and in manufacturing plant. Shall be positioned in CMRL depots where the project trains are tested and commissioned.	g. Testing and Commissioning Manager - with the responsibility of testing and commissioning of all the trains in depots and in manufacturing plant. Shall be positioned in CMRL depots (before 6 months of Prototype trains arrival) where the project trains are tested and commissioned.
39	Part 2: Sec VI	18.5.4.4.a & b	18.5.4.4 Failure Modes and Effects Criticality Analyses a) The Contractor shall develop a Failure Modes and Effects Criticality Analysis (FMECA) [CDRL 18-5]. The FMEA shall provide a systematic, comprehensive, bottom-up evaluation that uses design data to analyze the effects, their Criticality of potential component failures in a system, as installed. b) The FMEA shall assess the impact of failures on subsystem and system operation, and consequently on the operational safety of the transit system. The FMEA shall assess all failures that could cause or contribute to Category I or II hazards. c) FMECA analysis shall be submitted for both component level FMECA and Functional level FMECA for the components and functions of Rolling Stock.	18.5.4.4 Failure Modes and Effects Criticality Analyses a) The Contractor shall develop a Failure Modes and Effects Criticality Analysis (FMECA) [CDRL 18-5]. The FMECA shall provide a systematic, comprehensive, bottom-up evaluation that uses design data to analyze the effects their Criticality of potential component failures in a system, as installed. b) The FMECA shall assess the impact of failures on subsystem and system operation, and consequently on the operational safety of the transit system. The FMECA shall assess all failures that could cause or contribute to Category I or II hazards. c) FMECA analysis shall be submitted for both component level FMECA and Functional level FMECA for all Sub-systems and functions of Rolling Stock.
40	Part 2: Sec VI	Appendix 'C': 2.3.8.c	c) In Restricted Manual Mode the train operator shall be able to control Train's doors when the Train is stopped within the station stopping limits.	c) In Restricted Manual Mode, when the Train Operator uses the Permissive Door Button (PDB), the PSD also shall Open and close along with train doors using the direct communication path designed for PSD Open/close commands from train borne signalling in a safe manner.
41	Part 2: Sec VI	Appendix 'C': 2.3.9.b	b) The ATP Cut-out (By-pass) Mode shall be initiated by the train operator operating a sealed Safety Cut-out Switch (SCS) and simultaneously breaking its seal. The operation shall be recorded by the on-board digital counter and TCMS, OCC/BCC & DCC. The SCS shall be provided by RS Contractor. The on-board digital counter shall be provided by the STC Contractor.	b) The ATP Cut-out (By-pass) Mode shall be initiated by the train operator operating a sealed Safety Cut-out Switch (SCS) and simultaneously breaking its seal. The operation shall be recorded by the on-board digital counter and TCMS, OCC/BCC & DCC. The SCS shall be provided by RS Contractor and the on-board digital SCS counter shall be provided by the STC Contractor. RS contractor shall record the individual operations for High Speed SCS selection and Low speed SCS selection in TCMS and this data to be shared to STC upon Onboard ATC system activation.
42	Part 2: Sec VI	Appendix 'C': 2.4.10.c	c) Power Supply Interface - The power supply wiring between the Train power supply and the signalling termination board shall be supplied and connected by Rolling Stock Contractor. The Signalling Contractor will specify the power requirements. There shall be no relays or contacts between the negative return connection and the battery terminals	c) Power Supply Interface - The power supply wiring between the Train power supply and the signalling termination board shall be supplied and connected by Rolling Stock Contractor. The Signalling Contractor will specify the power requirements. For the power supply distribution from the battery of RS systems for the STC systems, the detailed interface wiring diagram needs to be agreed between the STC & RS Contractors

Sl. No.	Part/ Section No.	Clause No.	Original Clause	Revised Clause
43	Part 2: Sec VI	Appendix 'C': 2.4.12	2.4.12 It shall also be noted that changes in the interface specifications such as key alarms, remote commands, interface signals and GUI specifications etc., are to be expected throughout the project execution stage and shall extend even after commencement of UTO operation based on operational and passenger requirements. STC contractor and RS contractor system design shall be capable of accommodating these changes without major modification in the systems. Necessary spare interface points, communication band widths etc shall be incorporated into the design from the beginning of the design phase itself to accommodate these future requirements (This is in addition to the provisions for 3 car to 6 car conversion).	2.4.12 It shall also be noted that changes in the interface specifications such as key alarms, remote commands, interface signals and GUI specifications etc., are to be expected throughout the project execution stage and shall extend even after commencement of UTO operation based on operational and passenger requirements. Requirements identified in the Testing & Commissioning phase of various stages of train borne system needs to be factored in as a part of the contract. Likewise, in respect of UTO Operation only, the changes required from an operational perspective, need to be carried out as part of the Contractual obligations, if notified before the completion of DLP of the last stage. Beyond these periods, change request with reasonable EoT and Cost compensation will be considered. However, this is not applicable to rectification of snags identified during the DNP period of various stages, in respect of compliance with Performance & RAMS requirements of the Contract. STC contractor and RS contractor system design shall be capable of accommodating these changes without major modification in the systems. Necessary spare interface points, communication band widths etc shall be incorporated into the design from the beginning of the design phase itself to accommodate these future requirements (This is in addition to the provisions for 3 car to 6 car conversion).
44	Part 2: Sec VI	Appendix 'C': 2.4.52	2.4.52 In UTO mode, if train gets delocalized, the STC system should use memorized location so that train can move with less speed until next beacon. Once train passes the next beacon, train shall be localized and get normal speed authorization.	2.4.52 For the train getting delocalized because of a momentary external failure/ breakage, shall be able to resume the UTO operation with full speed once the interruption ceases.
45	Part 2: Sec VI	Appendix 'C': 2.4.65		2.4.65 The non-passenger trains shall have automatic preconfigured methods to reduce the auxiliary energy, controlled by ATR/ATS eg., controlling the HVAC, Saloon announcement system, Saloon lighting system etc. This configuration shall be capable of being amended by operator based on the special needs. STC and RS contractor shall identify the strategies for auxiliary power saving without affecting other requirements and implement the same
46	Part 2: Sec VI	Appendix 'C': 12.4 (Table)	2. Fire Load (RS Contractor) RS Contractor shall provide the details of: -train design heat release rate -fire growth rate and curve -heat of combustion -soot yield -CO yield (TVS Contractor)TVS Contractor shall obtain the necessary inputs for the Fire Load parameters to verify and validate the Tunnel Ventilation System design and TVF/OTE fan capacities	2. Fire Load (RS Contractor) RS Contractor shall provide the details of: -train design heat release rate -fire growth rate and curve -heat of combustion -soot yield -CO yield material composition for the train walls, train floor and the seats. (TVS Contractor)TVS Contractor shall obtain the necessary inputs for the Fire Load parameters to verify and validate the Tunnel Ventilation System design and TVF/OTE fan capacities
47	Part 2: Sec VI	Appendix 'C': 12.4 (Table)	3. Heat Release	3. Auxiliaries Heat Release
48	Part 2: Sec VI	Appendix 'C': 2.13.1		S. No.: 27 Item: Display of RTR-DMS feed in Video wall system at OCC/ BOCC/ DCC STC Contractor: Shall connect the feed and arrange for the display of RTR - DMS information. RS Contractor: Shall extend the RTR - DMS feed in a format compatible with the displays, as specified by the STC Contractor
49	Part 2: Sec VI	Appendix 'C': 4.7		S. No.: 9 Item: Stopping Accuracy PSD Contractor: PSD contractor shall open the door according to the train stopping accuracy. PSD contractor shall ensure that when doors are opened, it shall be minimum of 1400mm. RS Contractor: RS Contractor shall ensure that the train stops within ±300mm of station stopping point. This information shall be share to PSD contractor.
50	Part 3 : Sec VIII	PC (SC) 4.1.2	4.1.2 Establishment of manufacturing facility in India: The successful bidder shall establish metro cars manufacturing facility in India to manufacture at least 75% of the quantity ordered in this tender either through collaboration with companies based in India or by setting up an independent manufacturing unit in India. The contractor shall provide declaration through the Form 'Manufacturing Facility' that he will establish a manufacturing facility in India and will assemble/ manufacture at least 75% of the total ordered quantity.	4.1.2 Establishment of manufacturing facility in India: The successful bidder shall ensure that 75% of the quantity ordered in this bid is achieved by establishing / established metro cars manufacturing facility in India to manufacture or utilize existing Rolling Stock manufacturing facility in India for assembly works. The contractor shall provide declaration through the Form Manufacturing Facility that he will establish / established manufacturing facility in India to manufacture or utilize existing Rolling Stock manufacturing facility in India for assembly works 75% of the total ordered quantity. Note : Ordered Quantity refers to Trainset (ie., 70 Trainsets)
51	Part 2 : Sec VI	6.5.6	Passenger door close circuits shall have two circuits specific to each side of the car. One circuit shall monitor closing & opening of all doors per each side of the car. Another circuit shall monitor Locking & Un-locking of all doors per each side of car. Both Door control circuits of each train side shall be designed to be totally independent from each other and shall be independent from both door control circuits of opposite side of train, ensuring that failure of any door control circuit on one train side shall not affect the door operation on other train side.	Passenger door control circuits shall have two circuits specific to each side of the car. One circuit shall monitor closing & opening of all doors per each side of the car. Another circuit shall monitor Locking & Un-locking of all doors per each side of car. Both Door control circuits of each train side shall be designed to be totally independent from each other and shall be independent from both door control circuits of opposite side of train, ensuring that failure of any door control circuit on one train side shall not affect the door operation on other train side.
52	Part 2 : Sec VI	9.4.10	9.4.10 For maintenance purpose, there shall be additional by-pass ground switch in auxiliary converter inverter box duly interlocked with safety locks. Contractor shall submit the detail document for Engineer's review during design stage. (CDRL 9-24) 9.4.9 Smoke detectors / Heat detectors/LHD/other better heat detection systems shall be provided inside the Auxiliary Converter Inverter boxes, battery charger and in Battery Charger box. The status shall be linked to TCMS and communicated to RSC consoles of OCC, BCC & DCCs as Audio and Visual Alarms. Smoke and Heat detection system referred in ERTS Section 2.26 shall be complied.	9.4.10 For maintenance purpose, there shall be additional by-pass ground switch in auxiliary converter inverter box duly interlocked with safety locks. Contractor shall submit the detail document for Engineer's review during design stage. (CDRL 9-24) 9.4.9 Smoke detectors / Heat detectors/LHD/other better heat detection systems shall be provided inside the Auxiliary Converter Inverter boxes, battery charger and in Battery Charger box. The status shall be linked to TCMS and communicated to RSC consoles of OCC, BCC & DCCs as Audio and Visual Alarms. Smoke and Heat detection system referred in ERTS Section 2.26 shall be complied.
53	Part 1 : Section IV	Bidding Forms		New Clause : 11. Form JRSM : Japanese Rolling Stock Manufacturer We, M/s..... (Name of the Japanese Rolling Stock Manufacturing Company) confirm our participation with M/s..... (Name of the Indian Rolling Stock Manufacturing Company) as (JV Member / Sub-contractor) to extend our services for Final Assembly or the final refinement / processing with Indian Rolling Stock Manufacturer which also includes but not limited to technical cooperation, commissioning of manufacturing or provision of design as per Clause 10 of Part 1 – Section V – ESC of tender conditions. We M/s..... (Name of the Japanese Rolling Stock Manufacturing Company), hereby submit our credentials demonstrating Design, Manufacturing and Service Proven for Rolling Stock is attached herewith. Signature Japanese Rolling Stock Manufacturer/Indian Rolling Stock Manufacturer Name of the Authorized person Name of the Authorized person Designation of the Authorized person Designation of the Authorized person E-mail id of Authorized person E-mail id of Authorized person Note: This form is applicable only for the Indian Rolling Manufacturing Company as Prime Contractor / Lead Contractor.