3683429/2025/O/o PED/PS&EMU/RDSO

M/s Medha comments:

S. No	Document	Clause No.	Clause Description	M/s. Medha query	Suggested modified clause by M/s. Medha	RDSO Reply
1	**RDSO Specification**	**1.7.11.4**	Cyber Security Assurance Notwithstanding, the cyber security requirement defined elsewhere, the design of RS system should comply with ISO 27005, IEC62443 and TS50701, while designing and implementing the cybersecurity solution for the RS system. The RS contractor supplier has to ensure non-interference of security functionalities from safety. The RS contractor shall define procedures for assured operations and continuous monitoring of the security controls. The supplier contractor must ensure a non-intrusive, passive, real time continuous monitoring of the Rolling Stock network (TCMS, PA/PIS and passenger wi-fi networks) has no negative impact on the operation of the system. The system should be capable of understanding the railway protocols, asset types in real time in rolling stock network. The supplier	Cyber security is applicable for open system architecture or system based on open operating system or communicating on ISM band. Our TCMS is bare metal design where no open source is used and it can't be accessed and modified by any third party with the help of open software. So this is not applicable for RS components.	Please review and confirm	Please refer to modified clause 1.7.11.4.

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			RS contractor has to ensure next-generation threat detection to safeguard the operational network and from emerging cyber threats and ensure regulatory compliance. Major security objectives should include the following: 1. Restricting logical access to the network and network activity Restricting physical access to the network and devices. 2. Restricting unauthorized modification of data. 3. Detecting security events and incident. 4. Maintaining functionality during adverse conditions and restoring the system after an incident. 5. Restricting hacking, phishing, malware, DOS attack etc. The supplier Contractor shall be fully responsible for compliance with Cyber security standards and implementation of their System Safety & Cyber Security Assurance Plan. Any cost associated with implementation of Cyber			

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			security guidelines shall be deemed to be included in the bid proposal.			
2	**RDSO Specification**	**2.9.2 (a)**	A reliable Automatic fire detection and alarm system (with SIL2 compliant hardware) shall be provided, in accordance with Clause 4.19 of this specification covering the following areas: a) Electrical cabinets, traction converter, auxiliary converter etc. - Provision of Linear Heat Detector (LHD) cables (UL or EN approved).	Normally LHDC shall be used where temperature is high as point type detector works maximum upto 90 deg. So for temperature less than 90 deg C like control cabinets, point type detectors shall also be allowed.	a) Electrical cabinets- ***provision of point type heat detectors/LHDC*** traction converter, auxiliary converter etc. - Provision of Linear Heat Detector (LHD) cables (UL or EN approved).	Please refer to modified clause 2.9.2
3	**RDSO Specification**	**2.13.3**	The supplier shall develop RAMS targets both for the complete system and for the major Sub-systems such as transformer, traction converter, auxiliary converter, electronics, traction motor, Transmission and Suspension System, high voltage equipment, blowers and other auxiliary machines, such that it will provide a high level of dependability. RAMS targets shall also be developed for bought out items. The Supplier shall submit MTBF/MDBF at normal operating temperatures (considering ambient of 50°	RAMS or reliability prediction are done for lifetime of any equipments. So it is always recommended to calculate of predict RAMS for practical average scenario in which equipment operates. 50 Deg C is worst case ambient and it is not present always. It is better to calculate it at average temperature and 45 deg C is best approximation.	The supplier shall develop RAMS targets both for the complete system and for the major Sub-systems such as transformer, traction converter, auxiliary converter, electronics, traction motor, Transmission and Suspension System, high voltage equipment, blowers and other auxiliary machines, such that it will provide a high level of dependability. RAMS targets shall also be developed for bought out items. The Supplier shall submit	Considering high Indian temperatures, no change is envisaged.

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			C) for equipment given in Annexure VII.		MTBF/MDBF at normal operating temperatures (considering ambient of ~~***45-50***~~ ° C) for equipment given in Annexure VII.	
4	**RDSO Specification**	**4.1.1 (xxxx)**	3-phase to single phase underslung transformer of adequate capacity for auxiliary loads (not less than 20 kVA rating) generally conforming but not limited to ICF specification no. ICF/Elec/160 Rev 0 or latest. Further,3-phase to 3-phase isolation transformer/transformers (Y-Y, 415 V – 415V with neutral on secondary side) of adequate capacity around 80 KVA to cater the pantry loads of around 80 kVA operating at 415 V and 230 V shall be provided broadly conforming to RDSO specification No. RDSO/PE/SPEC/AC/0080-2007 (Rev.3) or latest	As there is separate pantry car available, load requirement has reduced inside the car. Also existing 20 kVA transformer has more rating for 230V load and less 110 V AC. So Rating shall be left to vendor to supply suitable rating of isolation transformer in each coach. For pantry 80 kVA transformer is OK.	3-phase to single phase underslung transformer of adequate capacity for auxiliary loads ~~***(not less than 20 kVA rating)***~~ generally conforming but not limited to ICF specification no. ICF/Elec/160 Rev 0 or latest. Further, 3-phase to 3-phase isolation transformer/transformers (Y-Y, 415 V – 415V with neutral on secondary side) of adequate capacity around 80 KVA to cater the pantry loads of around 80 kVA operating at 415 V and 230 V shall be provided broadly conforming to RDSO specification No. RDSO/PE/SPEC/AC/0080-2007 (Rev.3) or latest	Production Unit (PUs) may decide as per layout and load envisaged. Hence no change in the specification is envisaged.
5	**RDSO Specification**	**4.8.4**	TCMS shall have a diagnostics computer, with non-volatile memory, to store all the relevant diagnostic data. On	Annexure XII shall be replaced with Annexure X.		This is typographical error. Please refer to modified clause 4.8.4

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			occurrence of each fault, besides the fault information on equipment parameters, GPS location of Train, background data with time stamp shall also be captured and stored with a view to enable proper fault analysis. There shall be a facility to capture post-trigger and pre-trigger background information. The fault display to Driver shall also accompany the standard troubleshooting instructions in simple language. Diagnostic of fault up to the card level shall be specified. Faults shall be suitably prioritized and filtered so that the Driver and maintenance staff receives information appropriate to their roles. The diagnostic system shall be able to identify and log the faults of the Train and such data (including energy data) shall be stored for the duration of the storage for the memory shall be considered as per Annexure-XII. Licensed application software shall be provided to facilitate the fault diagnosis and the			

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			analysis of equipment wise failures. The steps required for investigation to be done, shall be displayed in simple language along with the background information. Offered software shall be compatible for working with commercially available operating systems.			
6	**RDSO Specification**	**4.11.12**	If an Exterior door is locked out of service or does not operate correctly, the unit shall provide visual information to Passengers and platform staff via a suitable visual indicator to be provided for indicating the status on the respective coach.	In case of exterior door problem, door indication of faulty indication can be provided by respective door control unit itself and hence this requirement is not related to PAPIS.	This clause can be deleted from PAPIS requirement.	Information broadcast/display to passenger in the whole coach and platform side regarding locked out door has to be done through PAPIS, so that passengers can choose correct gate. Hence, no change in the specification is envisaged
7	**RDSO Specification**	**4.11.13**	The PIS system provided shall be capable of automatically providing audio announcements that are triggered as part of the Exterior Door obstacle detection sequence. This message shall be audibly broadcast in the affected Vestibule and a suitable visual indicator to be provided for indicating the status adjacent to the Exterior Door.	In case of obstacle detection, audio visual indication is provided by respective door control unit itself. This requirement is not related to PAPIS.	This clause can be deleted from PAPIS requirement.	Information broadcast/display to passenger regarding obstacle detection at the door through PAPIS in concerned coach including vestibule is required so that corrective action could be taken. Please refer to modified clause 4.11.13

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8	**RDSO Specification**	**4.12.1**	The Passenger Car Surveillance System (PRSS) shall comprise of an IP based close circuit television (CCTV) network, surveillance cameras, routers and cables, monitors and other accessories as per RDSO Telecom Directorate Specification no. RDSO/SPN/TC/106/2022 (Version No. 2.1 or Latest)along with Annexure IX	This specification is not made considering integrated design of train. We had many round of discussion with RDSO/ICF/KM for previous projects. Earlier specification of CCTV was good specification which were in line with any other specification of train followed world wide. This specification is one of the main reason for delay in Kolkata Metro approval and will be here also without any added advantage. As we are not expert in CCTV system, we request RDSO to remove this from scope. IR can given to any suitable vendor who can supply such system. However seperate detailed comments are given seperately.	We recommend for separate detail deliberation with RDSO.	Please refer to modified clause no. 4.12.1

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9	RDSO Specification	4.20.1	The coaches shall be equipped with an audio/visual passenger alarm system. One special extra large size alarm pushbuttons shall be provided in each compartment of the Car for easy identification and access for the passengers. Each Car shall be provided with the following: • flush mounted alarm push mechanism with integrated dual LEDs to indicate the system is ok and alarm system activated anywhere in the coach , • flush mounted LED based Alarm indicator on each side of the coach – and outside of the coach also,	We undetstand from here that only external alarm to be provided on both side of coach. Please confirm.		Please refer to modified clause no. 4.20.1
10	RDSO Specification	4.28.3.1	The batteries shall be maintained at an adequate level of charge to satisfy the requirements of following Emergency Loads for a duration of 3 hours after the loss of OHE power: (i) Emergency ventilation in all Cars including Driving Cabs (ii) Communication system	Emergency loads are minimum loads required to be available during OHE Shutdown. Also any load which has no functional implication and which can be switched off shall be made off during OHE shutdown for optimal battery capacity. Berth reading light and charging sockets are no at all	The batteries shall be maintained at an adequate level of charge to satisfy the requirements of following Emergency Loads for a duration of 3 hours after the loss of OHE power: (i) Emergency ventilation in all Cars including Driving Cabs	Since it is a rare requirement, and this will unnecessarily increase size of battery, hence to avoid extra battery, carrying dead load of clause has been deleted. Please refer to modified clause no. 4.28.3.1

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			(PIS and PA system) (iii) Head light and Emergency light including Flasher lights (iv) Diagonally opposite doors on either side (v) Train controls (full load) (vi) Fire detection system (vii) For the purpose of capacity calculations, a total of 15 Close-Open operations of door per hour shall be considered. (viii) Power requirements for maintaining vacuum/ power for Vacuum Toilets including water raising apparatus system and pneumatic requirements for Vacuum Toilets. (ix) Integrated Berth reading light with 3 pin charging socket, its switches and USB type A and C fast charging panel and Berth Reading Light and Night Light cum berth Indication Light.	essential loads and shall not be considered as emergency load for battery capacity calculation. Also reading light and charging socket will work on 110 V AC not on DC.	(ii) Communication system (PIS and PA system) (iii) Head light and Emergency light including Flasher lights (iv) Diagonally opposite doors on either side (v) Train controls (full load) (vi) Fire detection system (vii) For the purpose of capacity calculations, a total of 15 Close-Open operations of door per hour shall be considered. (viii) Power requirements for maintaining vacuum/ power for Vacuum Toilets including water raising apparatus system and pneumatic requirements for Vacuum Toilets. (ix) ~~***Integrated Berth reading light with 3 pin charging socket, its switches and USB type A and C fast charging panel and Berth Reading Light and Night Light cum berth Indication Light.***~~	

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11	RDSO Specification	4.27.2	The auxiliary system shall be designed in such a way that in the event of failure of auxiliary converter(s) equivalent to one basic unit, all the loads (including air conditioning) shall work normally. In case of failure of next auxiliary converter equivalent to one basic unit, all the loads (including air conditioning) shall work normally. In case one more auxiliary converter fails equivalent to one basic unit, the unit with failed auxiliary converter shall work with 50% air conditioning, 100 % fresh air ventilation and all other loads shall be fully available. The above-mentioned design rules shall be fulfilled with a 24 car rake with six 4-car basic units or higher. During design state the detailed auxiliary design concept shall be submitted for approval. The changeover/load sharing shall be affected automatically and without any time delay through control electronics. Auxiliary converter shall be capable to cater the full auxiliary	We understand that as this clause is modified for 6 BU train, Auxiliary converter rating will be demonstrated on 24 car train only. Please confirm.	Please confirm.	Please refer modified clause no. 4.27.2 of Annexure-XII.

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			(100%) load at input voltage range between 19 kV to 30 kV AC and shall perform up to 17 kV OHE voltage at reduced output power. Reduction in output power will be gradually with the reduction of traction supply below the limit of 19kV. The auxiliary converter shall deliver at least 50% of the full rated capacity at 17 kV.			
12	**RDSO Specification**	**4.27.2**	The auxiliary system shall be designed in such a way that in the event of failure of auxiliary converter(s) equivalent to one basic unit, all the loads (including air conditioning) shall work normally. In case of failure of next auxiliary converter equivalent to one basic unit, all the loads (including air conditioning) shall work normally, the unit with failed auxiliary converter shall work with 50% air conditioning, 100 % fresh air ventilation and all other loads shall be fully available. In case one more auxiliary	This requirement is for 16 car chair car. In last paragraph, in case of 3 BU auxiliary converter failure, Air conditioning load has been asked to be ON for healthy BU which is not possible as this will be lot of loads for one Auxiliary converter. One Auxiliary converter has to cater, all pantry loads, complete Traction loads and complete ventilation loads. So our request to maintain same requirement as it was present during previous design.	The auxiliary system shall be designed in such a way that in the event of failure of auxiliary converter(s) equivalent to one basic unit, all the loads (including air conditioning) shall work normally. In case of failure of next auxiliary converter equivalent to one basic unit, all the loads (including air conditioning) shall work normally, the unit with failed auxiliary converter shall work with 50% air conditioning, 100 % fresh air ventilation and all other loads shall be	This is typographical error. Please refer to modified clause no. 4.27.2

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			converter fails equivalent to one basic unit, all the loads (including air conditioning) shall work normally, air conditioning shall be switched off and all other loads including fresh air ventilation shall work normally.		fully available. In case one more auxiliary converter fails equivalent to one basic unit, all the loads ~~***(including air conditioning)***~~ shall work normally, air conditioning shall be switched off and all other loads including fresh air ventilation shall work normally.	
13	**RDSO Specification**	**4.38.1**	All the Cars shall be air-conditioned with a minimum of two lightweight Aluminium alloy or better material body roof mounted packaged unit (RMPU) type air conditioning units in each Car. Driver's cab shall also be air- conditioned. Each packaged unit shall have two independent refrigerant circuits. It shall also be able to provide heating during winter through reverse cycle heating concept or alternate method based on suitability, proven technology and better efficiency. The control of both the air-conditioning	When VVVF controlled compressor is asked in this specification, we understand that frequency shall be varied smoothly over entire frequency range of operation of compressor and not only step frequency such as 40, 45 or 50 Hz. Please confirm. Also in this clause both compressor has been asked as VVVF where as in 4.38.14, only one compressor has been asked as VVVF. Please clarify.	Please clarify	1. Both the compressors have been made VVVF to improve energy efficiency and cooling performance 2. The variation in frequency shall be continuous over the entire range to achieve maximum efficiency as well as temperature control. Please refer to modified clause no. 4.38.14

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			unit shall be performed by suitably designed microprocessor controller. Both the compressors in each RMPU shall have automatic capacity control through hot gas bypass system or through VVVF control to optimize the efficiency of RMPU. The complete air system shall have EER (Ratio of capacity in BTU/Hour and the total power consumption in watts) better than 7.0 under the specified conditions. No material shall be used in construction of air conditioning unit that is liable to be adversely affected by vibration, damp, rotting or growth of moulds. Fire retardant material only should be used			
14	**RDSO Specification**	**Annexure -X (3)**	Faults data (along with facility to capture post-trigger and pre-trigger background information)	Storage is asked for 120 days for with post and pre trigger. This can be provided for Internal flash memory, but for crash hardened memory, fault can be provided for 120 days but fault with pre triggered data can only be provided for 3 days for 20% of daily fault. So this can be modified accordingly.		Please refer to modified Annexure-IX

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15	**RDSO Specification**	**Annexure-X (6)**	Driver-Guard Recording (Cab to Cab voice recording)	24 hours recoding does not means literal 24 hours recording as it will be data for many days in terms of voice recording as combinedly this activtivity can happen maximum for 30- 40 minutes daily including up and down journey. All these call is initiated by guard. So even if worst case we consider there shall be combined duration of recording for 24 hours in internal memory which still be data for many days.		Please refer to modified Annexure-IX
16	**RDSO Specification**	**Annexure-X (7)**	Emergency Talk Back Unit (Driver/Guard–Passenger Voice Recording)			
17	**RDSO Specification**	**Annexure-X (8)**	Public Announcement done by driver/guard			
18	**RDSO Specification**	**Annexure-X & 4.9**	Crash hardened Memory	Crash hardened memory is designed as per EN62625 which define what kind of parameters to be stored in crash hardened memory. Once standard is mentioned, we shall follow for data storage also.		Parameters as defined/mentioned in the RDSO technical specification and EN 62625 both are to be recorded in the event recorder.
19	**RDSO Specification**	**1.3.5 & 2.6.2, Note 1 & 2**	Weight of 24-car Train with passenger load @ 80 kg per passenger (including 10 kg for luggage) without inclusion of scope of supply of equipment contained in this specification shall be: a. = Gross weight -278 -307	The requirement defined in the Notes 1 & 2 are clear for the weight defined for the propulsion. However clause 1.3.5 & 2.6.2 in earlier specification refers to weight of the total train but the current values specified are	Please correct.	Please refer to modified clause no. 1.3.5 & 2.6.2 .

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			(please refer Note-1) ton (in case bogie is included in scope of supply) (Purchaser's scope) OR b. = Gross weight -278 (please refer Note-1) ton, (in case bogie is not included in scope of supply) (Purchaser's scope). & The guaranteed performance shall be available from 22.5 kV to 30 kV for a 16-car rake, not including the basic unit having pantry car, with gross train weight of: a. = Gross weight -185 -205 (please refer Note-2) ton (in case bogie is included in scope of supply) (Purchaser's scope) OR b. = Gross weight -185 (please refer Note-2) ton, (in case bogie is not included in scope of supply) (Purchaser's scope).	related to propulsion only. Please correct the clauses respectively.		
20	**RDSO Specification**	**1.7.11.4**	Cyber Security Assurance Notwithstanding, the cyber security requirement defined elsewhere, the design of RS system should comply with ISO 27005, IEC62443 and TS50701, while designing and implementing the cybersecurity solution for the	As PAPIS and Passenger Wifi network is not accessible to the open environment (internet). So this clause not applicable to RS components	Please review & confirm.	Please refer to modified clause no. 1.7.11.4

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			RS system. The RS contractor supplier has to ensure non-interference of security functionalities from safety. The RS contractor shall define procedures for assured operations and continuous monitoring of the security controls. The supplier contractor must ensure a non-intrusive, passive, real time continuous monitoring of the Rolling Stock network (TCMS, PA/PIS and passenger wi-fi networks) has no negative impact on the operation of the system. The system should be capable of understanding the railway protocols, asset types in real time in rolling stock network. The supplier RS contractor has to ensure next-generation threat detection to safeguard the operational network and from emerging cyber threats and ensure regulatory compliance. Major security objectives should include the following: 1. Restricting logical access to the network and network activity Restricting physical access to the network and			

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			devices. 2. Restricting unauthorized modification of data. 3. Detecting security events and incident. 4. Maintaining functionality during adverse conditions and restoring the system after an incident. 5. Restricting hacking, phishing, malware, DOS attack etc. The supplier Contractor shall be fully responsible for compliance with Cyber security standards and implementation of their System Safety & Cyber Security Assurance Plan. Any cost associated with implementation of Cyber security guidelines shall be deemed to be included in the bid proposal.			
21	**RDSO Specification**	4.10.8	A suitable interface shall be provided to enable the control centre to Passenger/Guard/Driver communication to be transmitted over the Train public address system.	Communication by Control Centre with Passenger is delivered via the PIS system, while communication with the driver and guard occurs through the radio system.	Please modify the requirement.	Clause is self-explanatory. No change in the specification is envisaged. A suitable interface shall be provided to enable communication of control centre with passenger/guard/driver to be

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						transmitted over the train public address system.
22	**RDSO Specification**	4.10.10	At least 6 speakers shall be provided in each coach. The number, positioning and output of each loudspeaker and power amplifier shall be designed such that an even sound coverage in all areas of the passenger Car is achieved. The loudspeaker should be separated into two groups and each audio line should be supplied by its own amplifier.	As Speaker count directly affects amplifier capacity, therefore it must be precisely defined based on the coach type	Please modify the requirement.	No change in the specification in envisaged
23	**RDSO Specification**	4.11.5	Each driving coach shall be provided with a front destination indicator board (Head Code) for good visibility in day and night of suitable size. Each Car shall be provided with two digital destination boards (minimum size- 128 x 16) of good visibility in day and night on the outside (one on each side) displaying the originating, destination station, Car number, Train number etc. Additionally, each Car shall have two exclusive LED	Size of the side Destination board indication is not mentioned. The display boards say 'minimum size,' but it's unclear whether this refers to dimensions (length and width) or a matrix size (number of rows and columns).	Please review & confirm.	Physical size of side destination board to be decided as per design of coach, to be finalized during design stage. Minimum size refers to LED matrix size.

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			matrix Single Side Display boards (minimum size-144x16) to be provided above the doorway (IC doors) inside each coach of the rake in order to show the information to the passengers sitting inside the coach like the following: Ø Name of approaching station Ø Current and next Halting Station Ø Time to next stations Ø Running speed Ø Platform side Ø Safety Messages Ø Late running status Ø Approximate distance to next station The mounting of the boards will be within the recess in the car body and suitably covered with glass. Digital Display Boards should be integrated with coach Body design.			
24	**RDSO Specification**	4.11.12	If an Exterior door is locked out of service or does not operate correctly, the unit shall provide visual information to Passengers and platform staff via a suitable visual indicator to be provided for indicating the	We recommend incorporating this functionality into the Door System, as it aligns with the Door System's core functions.	Please review & confirm.	Information broadcast/display to passenger in the whole coach and platform regarding locked out door has to be done through PAPIS, so that passengers can choose correct gate.

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			status on the respective coach.			Hence, no change in the specification is envisaged.
25	**RDSO Specification**	4.11.13	The PIS system provided shall be capable of automatically providing audio announcements that are triggered as part of the Exterior Door obstacle detection sequence. This message shall be audibly broadcast in the affected Vestibule and a suitable visual indicator to be provided for indicating the status adjacent to the Exterior Door.	We recommend incorporating this functionality into the Door System, as it aligns with the Door System's core functions.	Please review & confirm.	Please refer modified clause no. 4.11.13
26	**RDSO Specification**	4.43	Each Driving Car (Not in the driving cab) shall have provision for Centralized Coach Monitoring System (CCMS) for monitoring, recording and control of the air-conditioning and other faults e.g. power supply failure etc. CCMS shall also run diagnostic routines on the AC plant and generate alerts like low gas pressure in compressors, faulty sensors etc. Status/Health of Other functionalities viz. CCTV, PIS etc. and automatic voice announcement system shall	PAPIS and CCTV systems are in comfort network and CCMS display in control network. All the PIS data cannot be transferred to control network as the basic design for seperating the networks will not fullfill.So remove the point "Status/Health of Other functionalities viz. CCTV, PIS etc. and automatic voice announcement system" from CCMS display functionality from this clause.	Each Driving Car (Not in the driving cab) shall have provision for Centralized Coach Monitoring System (CCMS) for monitoring, recording and control of the air-conditioning and other faults e.g. power supply failure etc. CCMS shall also run diagnostic routines on the AC plant and generate alerts like low gas pressure in compressors, faulty sensors etc. Details shall be finalized at design stage.	No change in the specification is envisaged

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			also be available in CCMS. Details shall be finalized at design stage. Details shall be finalized at design stage. (i) The CCMS shall have touch screen display (minimum 18 inch size) and have suitable communication to microcontroller of RMPUs of each Car. The CCMS can use the same communication backbone as of TCMS. (ii) The CCMS shall also have GSM/GPRS based wireless modem through which information/alert to control centre/ maintenance staff shall be communicated. Information should also be available to the maintenance staff on a mobile application, which shall be developed by the Supplier. (iii) CCMS shall monitor the following: • Auto/bypassed mode working of Air Conditioning unit • Temperature (return air, supply air temperature and ambient temperature) • Pressure (Low pressure, High Pressure and Oil pressure in AC system) • LP & HP tripping		(i) The CCMS shall have touch screen display (minimum 18 inch size) and have suitable communication to microcontroller of RMPUs of each Car. The CCMS can use the same communication backbone as of TCMS. (ii) The CCMS shall also have GSM/GPRS based wireless modem through which information/alert to control centre/ maintenance staff shall be communicated. Information should also be available to the maintenance staff on a mobile application, which shall be developed by the Supplier. (iii) CCMS shall monitor the following: • Auto/bypassed mode working of Air Conditioning unit • Temperature (return air, supply air temperature and ambient temperature) • Pressure (Low pressure, High Pressure and Oil pressure in AC system) • LP & HP tripping	

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			• Compressor tripping • AC motors tripping • Other inputs and output to be decided during design approval stage These data shall be transmitted to the control centre through GPRS/GSM regularly at suitable intervals.		• Compressor tripping • AC motors tripping • Other inputs and output to be decided during design approval stage These data shall be transmitted to the control centre through GPRS/GSM regularly at suitable intervals.	
27	**CCTV 106 Specification**	**3.2**	The Video Surveillance system shall be based on non-proprietary open architecture and Software Development Kit (SDK) of the all Hardware is to be shared with the purchaser so that the system software can work and integrate with any IT Hardware.	Software is intellectual property for company and hence any 3rd party software developed on any SDK can't be installed and also SDK used for development can't be shared.	Please delete this clause	As per specification, SDK of all Hardware is to be shared with purchaser, Please refer modified clause no. 4.12.1 for latest version of CCTV specification no. RDSO/SPN/TC/106/2025 (Version 3.0 or latest) for requirement of CCTV, as per Telecom Directorate/RDSO letter No. RDSO-TELE0LKO(SPEC)/5/2019-Part(2) dated 30.01.2025
28	**CCTV 106 Specification**	**3.3**	Profile 'S' defines interoperability between Video Management Software / M-NVR and Camera. The System i.e. Mobile NVR, IP cameras and System Software shall be compliant to global standards ONVIF Profile 'S' for the interface	We confirm the integration of any standard ONVIF camera to NVR designed by us. However, NVR is proprietary designed by us and not listed on ONVIF site. Also SDK can't be shared	Please delete this clause	Please refer modified clause no. 4.12.1 for latest version of CCTV specification no. RDSO/SPN/TC/106/2025 (Version 3.0 or latest) for requirement of CCTV, as per Telecom Directorate/RDSO letter No. RDSO-

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			of network video product (ONVIF – Open Network Video Interface Forum). The quoted camera models should appear on the ONVIF conformant products under Device List & quoted Video Management Software / mobile NVR should appear under conformant Client List on the ONVIF website and a confirmation certificate for the offered models should be available at the time of supply. It should be confirmed from ONVIF Website at the time of supply while offered for inspection. In case ONVIF 'S' certification is not available, then to fulfill requirement of interoperability between Video Management Software/NVR and Camera, certification from Indian bodies i.e. TEC / TSEC, STQC, BIS or any accredited lab by them or any other Government / NABL accredited lab, is a mandatory requirement to be			TELE0LKO(SPEC)/5/2019-Part(2) dated 30.01.2025

S. No	Document	Clause No.	Clause Description	M/s. Medha query	Suggested modified clause by M/s. Medha	RDSO Reply
			submitted by the OEM / Vendor at the time of supply while offered for inspection. Software Development Kit (SDK) of all Hardware is to be shared with the purchaser for integration purposes.			
29	**CCTV 106 Specification**	**3.8.2**	Redundancy: Centralized Management Servers with N:1 redundancy (N is to be defined by the purchaser as per the requirement based on number of location / locations of the Data Center and their configuration) in Data Center /Centralized Location / Cloud shall be provided.	Server shall be IR scope	Please delete this clause	Non-technical issue. To be decided by the purchaser. However, please also refer modified clause no. 4.12.1 for latest version of CCTV specification no. RDSO/SPN/TC/106/2025 (Version 3.0 or latest) for requirement of CCTV, as per Telecom Directorate/RDSO letter No. RDSO-TELE0LKO(SPEC)/5/2019-Part(2) dated 30.01.2025
30	**CCTV 106 Specification**	**3.8.4**	Alert generation: Once an alert is generated, Central Server shall help in escalating a particular event to RFP's/Thana Posts using GPS/Indian Regional Navigation Satellite System (IRNSS) location of the train.	As discussed, last time and agreed that Rolling Stock server scope shall be limited to generating alert for various alarms. Configuring alert to Thana shall in IR scope	Please review & confirm	Please refer modified clause no. 4.12.1 for latest version of CCTV specification no. RDSO/SPN/TC/106/2025 (Version 3.0 or latest) for requirement of CCTV, as per Telecom Directorate/RDSO letter No.

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						RDSO-TELE0LKO(SPEC)/5/2019-Part(2) dated 30.01.2025
31	**CCTV 106 Specification**	**3.8.5**	Dashboard: Central Management System shall have a dashboard to display status of all requests pertaining to video footage by various RPF Thana/Post. CMS shall also provide a dashboard to respective RPF Thana/Post displaying status (in-progress/completed) of the requests created by that RPF Thana/Post.	In OCC, we can give all the output. Configuration to Thana level shall be in IR scope.	Please review & confirm	Please refer modified clause no. 4.12.1 for latest version of CCTV specification no. RDSO/SPN/TC/106/2025 (Version 3.0 or latest) for requirement of CCTV, as per Telecom Directorate/RDSO letter No. RDSO-TELE0LKO(SPEC)/5/2019-Part(2) dated 30.01.2025
32	**CCTV 106 Specification**	**3.8.6.1**	On reception of incident from RPF Thana/Post, Central Server shall create an entry & will be responsible for fetching the recordings related with the incident from the respective Train Coach-Video Recorder Unit/ Mobile NVR once it becomes live in the network. Subsequently, system should send an alert and it should change the state from in-process to close state and an acknowledgment to be shared to the RPF Thana/Post	Scope of this shall be limited to OCC level only.	Please delete this clause	Please refer modified clause no. 4.12.1 for latest version of CCTV specification no. RDSO/SPN/TC/106/2025 (Version 3.0 or latest) for requirement of CCTV, as per Telecom Directorate/RDSO letter No. RDSO-TELE0LKO(SPEC)/5/2019-Part(2) dated 30.01.2025

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33	CCTV 106 Specification	3.8.6.2	Once the RPF Thana/Post sees completed status in the dashboard against a particular request, they should be able to view the required video footage. Client at RPF Thana/Post should also have the facility to flag/mark indicating the duration (time period) for which the video footage need to be retained along with justification/remarks for the same. System shall also display the list of video footage with details e.g. date, duration, video recording unit, train no., video file size) being stored for long term retention as desired by RPF officials	Scope of this shall be limited to OCC level only	Please delete this clause	Please refer modified clause no. 4.12.1 for latest version of CCTV specification no. RDSO/SPN/TC/106/2025 (Version 3.0 or latest) for requirement of CCTV, as per Telecom Directorate/RDSO letter No. RDSO-TELE0LKO(SPEC)/5/2019-Part(2) dated 30.01.2025
34	CCTV 106 Specification	3.9	The Video data at Data Centre/ Cloud shall be accessible to any other centralized location or other clients through MPLS/IP network as per requirement of purchaser for Viewing and Monitoring.	Public IP shall be provided by IR.	Please confirm	Please refer modified clause no. 4.12.1 for latest version of CCTV specification no. RDSO/SPN/TC/106/2025 (Version 3.0 or latest) for requirement of CCTV, as per Telecom Directorate/RDSO letter No. RDSO-TELE0LKO(SPEC)/5/2019-

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						Part(2) dated 30.01.2025
35	CCTV 106 Specification	3.10	The Video Recorder Unit / Mobile NVR shall provide secured recording for evidence purposes and user authentication to protect data integrity. Necessary provisions for Cyber Security required for the system at different levels shall be implemented based on the latest technology and as specified by the purchaser. To ensure security of IP based CCTV in Coaches of Indian. Railways (Camera & Software) from vulnerabilities & breaches and discourage false undertaking from OEMs, security auditing and testing of equipment including source code of camera and software shall be carried out from STQC (Ministry of Electronics & Information Technology) or any other Government Agency from the list of CERT-In empanelled Information Security Auditing Organization. In order to ensure security of network and other IT equipment of	Cyber security requirement shall be removed.	Please delete this clause	As per Railway Board letter dated 18.03.2024 & MeitY Gazette dated 07.03.2024, cyber security certification is mandatory from STQC. However, please also refer modified clause no. 4.12.1 for latest version of CCTV specification no. RDSO/SPN/TC/106/2025 (Version 3.0 or latest) for requirement of CCTV, as per Telecom Directorate/RDSO letter No. RDSO-TELE0LKO(SPEC)/5/2019-Part(2) dated 30.01.2025

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			VSS system, before bulk supply and installation, purchaser should ensure that security auditing and testing at the time of POC (Proof of Concept) as well as at the time of completion of project are conducted or as specified by the purchaser. in case any security breach is found in the system at any stage including at POC level, immediate strict penal action is to be initiated by the purchaser.			
36	**CCTV 106 Specification**	**3.13**	Mean Time Between Failure (MTBF) calculated at 40°C for each type of camera should not be less than 1,00,000 hours for which OEM shall submit complete and detailed test reports issued from Govt. / NABL Accredited Test Labs / 3rd party test house of International repute such as UL, TUV etc.	MTBF is calculated or estimated value from respective vendor and no 3rd party certificate can be submitted for this. However we will meet MTBF of 1,00,000 hours	Please confirm	Please refer modified clause no. 4.12.1 for latest version of CCTV specification no. RDSO/SPN/TC/106/2025 (Version 3.0 or latest) for requirement of CCTV, as per Telecom Directorate/RDSO letter No. RDSO-TELE0LKO(SPEC)/5/2019-Part(2) dated 30.01.2025
37	**CCTV 106 Specification**	**3.17**	For RPF personnel & TC/TTEs, if required, Body Worn Camera may be procured by the concerned department as per the technical specification issued by Security Directorate,	System is designed for wired connection i.e. Camera with Ethernet. Body worn camera can't be interfaced.	Please delete this clause	Please refer modified clause no. 4.12.1 for latest version of CCTV specification no. RDSO/SPN/TC/106/2025 (Version 3.0 or latest) for requirement of CCTV, as per Telecom

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			Railway Board. It should be feasible to integrate such cameras over IP protocol with the existing Video Surveillance System for live feed & data records			Directorate/RDSO letter No. RDSO-TELE0LKO(SPEC)/5/2019-Part(2) dated 30.01.2025
38	**CCTV 106 Specification**	**4.1**	i) **xxi. Regulatory Approvals/Certifications** a. BIS / EN 50155 / IEC 60571r Rolling Stock application for Temperature, Humidity and Vibration. b. BIS/UL/EN/CE/IEC for Equipment Safety and BIS/EN/IEC/CE/FCC for EMI&EMC c. ONVIF Profile 'S' for the interface of network video product(ONVIF – Open Network Video Interface Forum) or interoperability compliance as per clause no. 3.3. SDK is to be shared with the purchaser for integration purpose. Note: 1) For BIS/EN/IEC/UL/CE/FCC, test certificate to be provided from internationally reputed and accredited test	xxi d)SDK can't be shared xxii- OWASP certification is not available	Please delete this clause	Please refer modified clause no. 4.12.1 for latest version of CCTV specification no. RDSO/SPN/TC/106/2025 (Version 3.0 or latest) for requirement of CCTV, as per Telecom Directorate/RDSO letter No. RDSO-TELE0LKO(SPEC)/5/2019-Part(2) dated 30.01.2025. As per Railway Board letter dated 18.03.2024 &MeitY Gazette dated 07.03.2024, cyber security certification is mandatory from STQC.

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			Labs/agencies or NABL/NABCB accredited Labs. 2) BIS/EN/IEC Standards for Temperature, Humidity, Vibration and EMI/EMC which are part of EN 50155 or IEC 60571 are also applicable as EN 50155 / IEC 60571Certification **xxii. Security Verification Certification** a. The Full HD Fixed Dome/wedge type IP Colour Camera shall have security features which can be deployed meeting the security assurance requirements as per relevant clauses / paras mutually decided by Purchaser & STQC (or other Govt. Agency as per note below) regarding "Appendix C of OWASP: Internet of Things Verification Requirements" of OWASP Application Security Verification Standard version 4.0 - Level 2 for CCTV with relevant and equivalent			

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			safeguards. Note: The Regulatory Approvals / Certifications are to be provided from STQC (Ministry of Electronics & Information Technology) or any other Government Agency from the list of CERT-in empanelled Information Security Auditing Organization			
39	**CCTV 106 Specification**	**4.2**	**xvii. Software Features** Software features shall be as per Clause no. 4.6 of the specification	xvii- Panic button interface will be met as required but interface may not required in NVR	Please delete this clause	Please refer modified clause no. 4.12.1 for latest version of CCTV specification no. RDSO/SPN/TC/106/2025 (Version 3.0 or latest) for requirement of CCTV, as per Telecom Directorate/RDSO letter No. RDSO-TELE0LKO(SPEC)/5/2019-Part(2) dated 30.01.2025
40	**CCTV 106 Specification**	**4.6.8.1**	The Software shall support continuous recording, activity control recording, motion detection recording and Alarm and Trigger input recording etc.	Can be Complied for continuous video recording and alarms. Not complied for other recordings.	Please review & confirm.	Please refer modified clause no. 4.12.1 for latest version of CCTV specification no. RDSO/SPN/TC/106/2025 (Version 3.0 or latest) for requirement of CCTV, as per Telecom

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						Directorate/RDSO letter No. RDSO-TELE0LKO(SPEC)/5/2019-Part(2) dated 30.01.2025
41	**CCTV 106 Specification**	**4.6.15**	Face image cropping tool shall run on 4 CCTV cameras installed at 4 entry / exit doors of each coach. Face image cropping tool on the camera and/ or video recording unit/ Mobile NVR shall identify the faces of person from the live feed and crop it which should meet the requirement of FRS (whenever facial recognition software is applicable). This face image with the metadata shall be sent over Wi-Fi or LTE network to Face matching Server at Data center / Cloud for matching.	Can not be complied.	Please delete this clause	Please refer modified clause no. 4.12.1 for latest version of CCTV specification no. RDSO/SPN/TC/106/2025 (Version 3.0 or latest) for requirement of CCTV, as per Telecom Directorate/RDSO letter No. RDSO-TELE0LKO(SPEC)/5/2019-Part(2) dated 30.01.2025
42	**CCTV 106 Specification**	**4.6.16**	The System Software shall be compliant to global standards ONVIF Profile 'S' or interoperability compliance as per Clause 3.3. SDK is to be shared with the purchaser for integration purposes.	SDK can't be shared.	Please delete this clause	As per specification, SDK of all Hardware is to be shared with purchaser. However please also refer modified clause no. 4.12.1 for latest version of CCTV specification no. RDSO/SPN/TC/106/2025 (Version 3.0 or latest) for requirement of CCTV, as

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						per Telecom Directorate/RDSO letter No. RDSO-TELE0LKO(SPEC)/5/2019-Part(2) dated 30.01.2025
43	**CCTV 106 Specification**	**4.6.17**	Security Verification Certification: The System Software shall have security features which can be deployed meeting the security assurance requirements as per Relevant clauses / paras to be applicable for security, vulnerabilities, etc. Such clauses / paras shall be mutually decided by Purchaser and STQC (Ministry of Electronics & information Technology) or any other Government Agency from the list of CERT-In empanelled Information Security Auditing Organization for testing and issuing the certificate/clearance.	Can not be complied.	Please delete this clause	As per Railway Board letter dated 18.03.2024 & MeitY Gazette dated 07.03.2024, cyber security certification is mandatory from STQC. However please also refer modified clause no. 4.12.1 for latest version of CCTV specification no. RDSO/SPN/TC/106/2025 (Version 3.0 or latest) for requirement of CCTV, as per Telecom Directorate/RDSO letter No. RDSO-TELE0LKO(SPEC)/5/2019-Part(2) dated 30.01.2025
44	**CCTV 106 Specification**	**4.7**	**Facial Recognition System*: (Tentative for User Trial/Proof of Concept/Pilot Project)** *Note: This Facial Recognition Software (FRS)			Please refer modified clause no. 4.12.1 for latest version of CCTV specification no. RDSO/SPN/TC/106/2025 (Version 3.0 or latest) for requirement of CCTV, as

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			is tentatively for User Trial/ Proof of Concept/ Pilot Project only. User Trial/ Proof of Concept/ Pilot Project to be carried out by the concerned Directorate who would be authorized to execute the Tender and representatives of RPF and GRP will be made part of the Evaluation Committee to evaluate the product as the User Departments to ascertain its suitability with regards to Crime Prevention/ Detection while S&T representative will be the third member of the committee as a technical member who may evaluate the technical and specification requirements. The results of the trial along with the recommendations by the committee should be submitted to the Security Directorate and after the formal approval is accorded, the FRS may be finalized for general application. The Face Recognition Software shall be deployed on Sewers at Data Center/ Cloud/ Centralized location			per Telecom Directorate/RDSO letter No. RDSO-TELE0LKO(SPEC)/5/2019-Part(2) dated 30.01.2025

S. No	Document	Clause No.	Clause Description	M/s. Medha query	Suggested modified clause by M/s. Medha	RDSO Reply
			as specified by the purchaser with the following minimum requirements:			
45	**CCTV 106 Specification**	**4.7.1**	The Face Recognition Algorithm vendor should have participated and have established in the Face Recognition Algorithm Evaluation conducted by NIST (National Institute of Standards and Technology, U.S. Department of Commerce) or from any Government Test Labs authorized for it. The benchmark/ latest performance FRVT test results of current calendar year with respect to the opening date of tender or last 1 preceding year, the performance efficiency of the algorithm shall be within the top 25 ranked algorithms of the FRVT (1:N) test results with FNIR (N=1.6M, T=0, Rank=1).	Can not be complied.	Please delete this clause	Please refer modified clause no. 4.12.1 for latest version of CCTV specification no. RDSO/SPN/TC/106/2025 (Version 3.0 or latest) for requirement of CCTV, as per Telecom Directorate/RDSO letter No. RDSO-TELE0LKO(SPEC)/5/2019-Part(2) dated 30.01.2025
46	**CCTV 106 Specification**	**4.7.2**	FRS Central Database server as specified by the purchaser for Facial Recognition system in High Availability (HA) shall be hosted in Cloud/ centralized location/ Data center.	Can not be complied.	Please delete this clause	Please refer modified clause no. 4.12.1 for latest version of CCTV specification no. RDSO/SPN/TC/106/2025 (Version 3.0 or latest) for requirement of CCTV, as per Telecom

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						Directorate/RDSO letter No. RDSO-TELE0LKO(SPEC)/5/2019-Part(2) dated 30.01.2025
47	**CCTV 106 Specification**	**4.7.3**	For processing of metadata generated from Video Recording Unit/ Mobile NVR configured based on coach (unique) number in train coaches, adequate numbers of Face Matching Servers shall be provided at cloud/ data center assuming a minimum load of 100 new faces per hour per coach. Central face matching engine shall have capability to process face matching request from the coaches sequentially with Queue management and load balancing for the matching request.	Can not be complied.	Please delete this clause	Please refer modified clause no. 4.12.1 for latest version of CCTV specification no. RDSO/SPN/TC/106/2025 (Version 3.0 or latest) for requirement of CCTV, as per Telecom Directorate/RDSO letter No. RDSO-TELE0LKO(SPEC)/5/2019-Part(2) dated 30.01.2025
48	**CCTV 106 Specification**	**4.7.4**	Matching response shall be available on web-based application which can be configured for individual users at railway stations, central location etc.	Can not be complied.	Please delete this clause	Please refer modified clause no. 4.12.1 for latest version of CCTV specification no. RDSO/SPN/TC/106/2025 (Version 3.0 or latest) for requirement of CCTV, as per Telecom Directorate/RDSO letter No. RDSO-TELE0LKO(SPEC)/5/2019-

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						Part(2) dated 30.01.2025
49	**CCTV 106 Specification**	**4.7.5**	If the system detects any match, then alerts carrying coach (unique) number, frame of the detected person etc. shall be sent to the Command Control Centre and nearest RPF Thana/ Post via shortest route calculation using GPS location of the train through available Wi-Fi or LTE network.	Can not be complied.	Please delete this clause	Please refer modified clause no. 4.12.1 for latest version of CCTV specification no. RDSO/SPN/TC/106/2025 (Version 3.0 or latest) for requirement of CCTV, as per Telecom Directorate/RDSO letter No. RDSO-TELE0LKO(SPEC)/5/2019-Part(2) dated 30.01.2025
50	**CCTV 106 Specification**	**4.7.6**	The system shall have in-built tool with capability to build partial faces and enhancement of quality of image before enrollment.	Can not be complied.	Please delete this clause	Please refer modified clause no. 4.12.1 for latest version of CCTV specification no. RDSO/SPN/TC/106/2025 (Version 3.0 or latest) for requirement of CCTV, as per Telecom Directorate/RDSO letter No. RDSO-TELE0LKO(SPEC)/5/2019-Part(2) dated 30.01.2025
51	**CCTV 106 Specification**	**4.7.7**	Software such as Facial Recognition etc. as required by the purchaser shall run on the Cloud/ Data Centre and it should be possible to send alarms to central location/ Command Control Centre software through available	Can not be complied.	Please delete this clause	Please refer modified clause no. 4.12.1 for latest version of CCTV specification no. RDSO/SPN/TC/106/2025 (Version 3.0 or latest) for requirement of CCTV, as per Telecom

S. No	Document	Clause No.	Clause Description	M/s. Medha query	Suggested modified clause by M/s. Medha	RDSO Reply
			network.			Directorate/RDSO letter No. RDSO-TELE0LKO(SPEC)/5/2019-Part(2) dated 30.01.2025
52	**CCTV 106 Specification**	**4.7.9**	The FRS Solution should preferably possess Artificial Intelligence and Machine Learning Functional Capabilities for Higher Accuracy	Can not be complied.	Please delete this clause	Please refer modified clause no. 4.12.1 for latest version of CCTV specification no. RDSO/SPN/TC/106/2025 (Version 3.0 or latest) for requirement of CCTV, as per Telecom Directorate/RDSO letter No. RDSO-TELE0LKO(SPEC)/5/2019-Part(2) dated 30.01.2025
53	**CCTV 106 Specification**	**4.7.10**	Quality of the Facial Recognition System Output	Can not be complied.	Please delete this clause	Please refer modified clause no. 4.12.1 for latest version of CCTV specification no. RDSO/SPN/TC/106/2025 (Version 3.0 or latest) for requirement of CCTV, as per Telecom Directorate/RDSO letter No. RDSO-TELE0LKO(SPEC)/5/2019-Part(2) dated 30.01.2025
54	**CCTV 106 Specification**	**4.7.11**	Software Solution at each in Railway Coach should have a mechanism to accept and process on a real time any new image of a Criminal or	Can not be complied.	Please delete this clause	Please refer modified clause no. 4.12.1 for latest version of CCTV specification no. RDSO/SPN/TC/106/2025

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			update from Data Central/ Centralized location/ Cloud.			(Version 3.0 or latest) for requirement of CCTV, as per Telecom Directorate/RDSO letter No. RDSO-TELE0LKO(SPEC)/5/2019-Part(2) dated 30.01.2025
55	**CCTV 106 Specification**	**4.7.12**	Security Verification Certification: The Face Recognition Software shall have security features which can be deployed meeting the security assurance requirements as per Relevant clauses / paras to be applicable for security, vulnerabilities, etc. Such clauses / paras shall be mutually decided by Purchaser and STQC (Ministry of Electronics & Information Technology) or any other Government Agency from the list of CERT-ln empanelled Information Security Auditing Organization for testing and issuing the certificate / clearance.	Can not be complied.	Please delete this clause	Please refer modified clause no. 4.12.1 for latest version of CCTV specification no. RDSO/SPN/TC/106/2025 (Version 3.0 or latest) for requirement of CCTV, as per Telecom Directorate/RDSO letter No. RDSO-TELE0LKO(SPEC)/5/2019-Part(2) dated 30.01.2025
56	**CCTV 106 Specification**	**4.8**	Server	Can not be complied. Server Scope shall be in IR.	Please delete this clause	Please refer modified clause no. 4.12.1 for latest version of CCTV specification no. RDSO/SPN/TC/106/2025

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						(Version 3.0 or latest) for requirement of CCTV, as per Telecom Directorate/RDSO letter No. RDSO-TELE0LKO(SPEC)/5/2019-Part(2) dated 30.01.2025
57	**CCTV 106 Specification**	**4.9.1**	STP CAT-6 or better Cable: Fire Retardant STP (Shielded Twisted Pair) CAT-6 Cable or better shall be compliant with latest EIA/TIA-568-B.2-1 and IEC/EN 60332-1 standard or equivalent BIS for both**.**	This cable is only train backbone cable and not for end device. For end device like camera and NVR, CAT5e cable will be used.	Please modify the requirement.	Please refer modified clause no. 4.12.1 for latest version of CCTV specification no. RDSO/SPN/TC/106/2025 (Version 3.0 or latest) for requirement of CCTV, as per Telecom Directorate/RDSO letter No. RDSO-TELE0LKO(SPEC)/5/2019-Part(2) dated 30.01.2025
58	**CCTV 106 Specification**	**4.10**	Command Control Centre Software & Hardware: Command Control Centre software & hardware shall be as per RDSO/SPN/TC/65/2021, Version 6.0 or latest.	Mentioned specification is for platform side camera system.	Please delete this clause	Please refer modified clause no. 4.12.1 for latest version of CCTV specification no. RDSO/SPN/TC/106/2025 (Version 3.0 or latest) for requirement of CCTV, as per Telecom Directorate/RDSO letter No. RDSO-TELE0LKO(SPEC)/5/2019-Part(2) dated 30.01.2025

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59	CCTV 106 Specification	6.6.4	Visual inspection and Performance test: For Visual Inspection and Performance test, equipment/system shall be tested to ensure compliance of relevant specification. The compliance to Regulatory Approvals / Certifications as applicable shall be submitted with documentary proof which is enumerated below: i) BIS/EN 50155/ IEC 60571 for Rolling Stock application ii) BIS/UL/EN/CE/IEC for Equipment Safety iii) BIS/EN/IEC/CE/FCC for EMI & EMC iv) ONVIF Profile 'S' or interoperability Each equipment of the system shall be visually inspected to ensure compliance with the requirement of relevant clauses no. 4.1, 4.3, 4.4 & 4.2/4.5 along with 4.6, 4.7 & 4.8 of the specification. The visual inspection shall broadly include: i) Constructional details ii) Dimensional check iii) General workmanship iv) Configuration Performance of each	Similarly NVR is designed to interface ONVIF compliant camera. Certification as per ONVIF not required for NVR.	Please review and confirm.	Please refer modified clause no. 4.12.1 for latest version of CCTV specification no. RDSO/SPN/TC/106/2025 (Version 3.0 or latest) for requirement of CCTV, as per Telecom Directorate/RDSO letter No. RDSO-TELE0LKO(SPEC)/5/2019-Part(2) dated 30.01.2025

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			equipment/system shall be tested to ensure compliance with the requirement of relevant clauses no. 4.1, 4.3, 4.4 & 4.2/4.5 along with 4.6, 4.7 & 4.8 of the specification.			
60	**CCTV 106 Specification**	**6.6.6**	Face Recognition Software (whenever applicable): The Face Recognition Software shall be tested for its performance as per clause no. 4.7 along with required no. of Cameras and other required devices & equipments.	Can not be complied.	Please delete this clause	Please refer modified clause no. 4.12.1 for latest version of CCTV specification no. RDSO/SPN/TC/106/2025 (Version 3.0 or latest) for requirement of CCTV, as per Telecom Directorate/RDSO letter No. RDSO-TELE0LKO(SPEC)/5/2019-Part(2) dated 30.01.2025
61	**CCTV 106 Specification**	**6.8**	i)Face Recognition Software (whenever applicable) ii)Server Hardware (Data Centre)	Face recognition & Server Hardware is not complied.	Please delete this clause	Please refer modified clause no. 4.12.1 for latest version of CCTV specification no. RDSO/SPN/TC/106/2025 (Version 3.0 or latest) for requirement of CCTV, as per Telecom Directorate/RDSO letter No. RDSO-TELE0LKO(SPEC)/5/2019-Part(2) dated 30.01.2025

M/s. Siemens:

S. No.	Part no /Section No..	Clause No.	Clause Description	Clarifications/Suggestions of M/s. Siemens	RDSO reply
1.	Draft RDSO specification No. RDSO/ PE/ SPEC/EMU/ 0196-2024 (Rev.1) & RDSO Annexure XIII	1.3.5	Weight of 24-car Train with passenger load @ 80 kg per passenger (including 10 kg for luggage) without inclusion of scope of supply of equipment contained in this specification shall be: a. = Gross weight -278 -307 (please refer Note-1) ton (in case bogie is included in scope of supply) OR b. = Gross weight -278 (please refer Note-1) ton, (in case bogie is not included in scope of supply)	Based on the weight provided for coaches without propulsion now calculated train weight is 820t (without overload) for 16 car train, which is 78t higher than weight provided in RDSO sepc rev0 (742t for 16 car train). We request to keep scope of weight of propulsion supplier to be maximum 204t (without HVAC duct) and gross weight of train to be maximum 960t. So the performance can be guaranteed for 960t, based on RDSO spec Rev0. Weight of train, gross weight & scope of weight of propulsion supplier for 24 car train should be increased proportionately.	Please refer modified clause no. 1.3.5
2.	Draft RDSO specification No. RDSO/ PE/ SPEC/EMU/ 0196-2024 (Rev.1)	1.3.7	In developing the detailed design, the supplier shall acquaint himself and take note of the track and environmental operating conditions prevailing on IR specially during heavy monsoon, track flooding conditions, saline, humid and dusty atmosphere **etc.**	Please clarify the "etc" in mentioned clause.	To be discussed in design stage
3.	Draft RDSO specification No. RDSO/ PE/ SPEC/EMU/ 0196-2024 (Rev.1)	1.7.1	Software shall be written in a structured manner and fully documented during all stages of its design and development. This shall meet the requirements of EN	EN 50657 is created in place of EN 50128 for software development in rolling stock application keeps the same structure as EN 50128. So	Please refer modified clause no. 1.7.1

S. No.	Part no /Section No..	Clause No.	Clause Description	Clarifications/Suggestions of M/s. Siemens	RDSO reply
			50126-2: The specification and Demonstration of Reliability, Availability, Maintainability and Safety (RAMS) - Part 2, EN 50128 : Railway Applications : Software for Railway Control and Protection Systems, and EN 50129: Safety-related Electronic Railway Control and Protection Systems.	Siemens recommend to keep an alternate provision for software development as per EN 50657.	
4.	Draft RDSO specification No. RDSO/ PE/ SPEC/EMU/ 0196-2024 (Rev.1)	1.7.11	Cyber Security	Please clarify the scope of the security requirements mentioned in chapter 1.7.11.1, as it specifies that these requirements apply solely to systems communicating via ISM Bands which is very generic (which also involves scope cyber security requirements for S&TC, system that limited data wirelessly over ISM band) requirement. However, in chapter 1.7.11.4, it expands the requirement to the RS system. Also please provide a list of systems to which these requirements are applicable?	Please refer modified clause no. 1.7.11
5.	Draft RDSO specification No. RDSO/ PE/ SPEC/EMU/ 0196-2024 (Rev.1)	1.7.11.1 para 2	…..... The supplier shall define procedures for assured operations and continuous monitoring of the security controls. Relevant Standards for compliance: - a. ISO 27005	we understand that, way side hardware (OS and firmware) procurement shall be responsibility of purchaser with the necessary support from bidder. Please clarify.	Software and hardware in the scope of supplier be followed the cyber security. Scope to be further defined by the purchaser PUs. Please also refer modified clause

S. No.	Part no /Section No..	Clause No.	Clause Description	Clarifications/Suggestions of M/s. Siemens	RDSO reply
			b. IEC 62443 c. TS 50701 Cyber Security measures such as, Backup and Disaster recovery, Antivirus, perimeter security devices (firewall, IPS/IDS, Proxy), Active Directory and Domain server, Encryption for data transmission and SAN storage server on a Centralised network. Also, shall cover Identity and Access Management, Application Security, threat and vulnerability management. For this purpose, supplier shall engage a Cyber Security Consultant, who will recommend Cyber Security Guidelines complying the requirements of above standards.		no. 1.7.11
6.	Draft RDSO specification No. RDSO/ PE/ SPEC/EMU/ 0196-2024 (Rev.1)	1.7.11.3	The supplier Contractor shall be fully responsible for compliance with Cyber security standards and implementation of their System Safety & Cyber Security Assurance	We understand that the mentioned clause is for cyber security, and not for the system safety which is already covered under relevant clauses i.e. 2.13 & 4.9.17. Please clarify.	Please refer modified clause no. 1.7.11
7.	Draft RDSO specification No. RDSO/ PE/ SPEC/EMU/ 0196-2024 (Rev.1)	1.7.11.4	…..The supplier contractor must ensure a non-intrusive, passive, real time continuous monitoring of the Rolling Stock network (TCMS, PA/PIS and passenger wi-fi networks) has no negative impact on the operation of the system…..	This section is unclear regarding the necessity of a monitoring system. Kindly clarify whether a monitoring system is required, or if required whether it is in the scope of the bidder.	Please refer modified clause no. 1.7.11.4

S. No.	Part no /Section No..	Clause No.	Clause Description	Clarifications/Suggestions of M/s. Siemens	RDSO reply
8.	Draft RDSO specification No. RDSO/ PE/ SPEC/EMU/ 0196-2024 (Rev.1)	1.11.18	Rating plate All equipment/cubicles shall contain non-detachable rating plates of anodized aluminum with embossed letters and fitted in a visible position. The rating plate will give detailed rating specification and identification of equipment.	Instead of having the name plate with anodized aluminium, M/s Siemens propose to consider the stainless steel name plate as an alternate, which has longer life and advantage that QR-Code can be lasered. Stainless steel name plate is also a standard practice in Siemens.	Please refer modified clause no. 1.11.18
9.	Draft RDSO specification No. RDSO/ PE/ SPEC/EMU/ 0196-2024 (Rev.1) - Annexure XIII	2.6.2	The guaranteed performance shall be available from 22.5 kV to 30kV for 16 car rake….	In several clauses of the RDSO specification it is mentioned to follow IEC 61287 (Railway applications – Power converters installed on board rolling stock). IEC 61287 internally called for IEC 60850. The supply voltages of 25 kV OHE Traction system for railway application are defined by IEC 60850:2014. For Power System perspective according to EN 50160:2022 (E), For 25kV(Uc), 50hz system, under normal operating conditions, excluding the periods with interruptions, supply voltage variations should not exceed ± 10 % of the declared voltage. Additionally, at higher voltage the level of inter harmonics will be increased due to the application of power electronics converters and similar control	Please refer modified clause no. 2.6.2

S. No.	Part no /Section No..	Clause No.	Clause Description	Clarifications/Suggestions of M/s. Siemens	RDSO reply
				equipment. Therefore considering above points, we request that for the guaranteed traction performance IEC 60850:2014 to be followed. Otherwise we request RDSO to specify the maximum duration (e.g 30 mins) of continuous operation at 30kV for which design to be considered, keeping in mind different neutral sections and substations. What will the frequency of occurrence of such OHE voltages (e.g no of occurrences in a day / month / year etc or percentage in a lifetime). Refer clause 2.8 of RDSO spec. Rev1: "Train shall achieve a minimum power factor of 0.98 as measured at the pantograph. The power factor shall be governed by EN 50388". We understand that as per IEC 50388 power factor shall be maintained till 10% above the 25KV AC traction voltage.	
10	Draft RDSO specification No. RDSO/ PE/ SPEC/EMU/ 0196-2024	2.6.2	The guaranteed performance shall be available from 22.5 kV to 30kV for 16 car rake….	Please allow max propulsion weight as 185t without HVAC duct for 16 car train.	Please refer modified clause no. 1.3.5 & 1.4.5

<table>
<tr><th>S. No.</th><th>Part no /Section No..</th><th>Clause No.</th><th>Clause Description</th><th>Clarifications/Suggestions of M/s. Siemens</th><th>RDSO reply</th></tr>
<tr><td></td><td>(Rev.1) - Annexure XIII</td><td></td><td>…a. = Gross weight -185 -205 (please refer Note-2) …...

Note-2 …..... maximum weight of propulsion system excluding Bogie as 185 ton & Bogie weight as 205 ton for 16 car.</td><td>As per Note2 of annexure xiii - Gross weight will be defined by PUs for performance simulation.

As per ICF Annexure 1 for 50 TS bid (as given below) due in May2024, the gross weight is calculated to be around 1005 tons for 16 car train without overload. And it increases further with overload.
Kindly confirm whether the guaranteed performance can be conducted as per the weight mentioned in clause 2.6.2. (page no. 24) after addition of weight of propulsion scope of supply.

The Approximate weights of the Coaches without Propulsions system weights is as follows – All weights are in Tons
<table><tr><th>Coach Type</th><th>Tare weight without Propulsion*</th><th>Normal Payload</th><th>Overload</th></tr><tr><td>DTC-3T</td><td>44.82</td><td>4.676</td><td>0.8</td></tr><tr><td>MC-3T</td><td>47.6</td><td>5.6</td><td>2.08</td></tr><tr><td>TC-3T</td><td>47</td><td>5.25</td><td>2.08</td></tr><tr><td>MC-2T</td><td>46.4</td><td>4.24</td><td>2.08</td></tr><tr><td>NDTC-1A</td><td>44.37</td><td>2.23</td><td>2.08</td></tr><tr><td>NDTC-Pantry</td><td>44.37</td><td>4.367</td><td>0</td></tr><tr><td>NDTC-2T</td><td>45.87</td><td>4.24</td><td>2.08</td></tr></table>*RMPU and Airconditioning ducting are part of Propulsion system</td><td>However gross weight of the train may be commented upon by PUs</td></tr>
</table>

S. No.	Part no /Section No..	Clause No.	Clause Description	Clarifications/Suggestions of M/s. Siemens	RDSO reply
11	Draft RDSO specification No. RDSO/ PE/ SPEC/EMU/ 0196-2024 (Rev.1) & Annexure XIII	2.6.2	…..Train to meet the performance requirements of this specification at 22.5 kV shall not exceed 600 Amp….. …... the reduction in power below 22.5 kV should be proportional to reduction in voltage…..	We request to kindly add the following text in underlined. "….. however, reduction in power below 22.5kv should be proportional to reduction in voltage and reduction in system efficiency, subject to maximum line current limited to nominal current as drawn at rated voltage of 22.5kv."	Clause is self-explanatory. No change in the specification is envisaged. However, please also refer modified clause no. 2.6.2
12.	Draft RDSO specification No. RDSO/ PE/ SPEC/EMU/ 0196-2024 (Rev.1)	2.9.2	….. a) Electrical cabinets, traction converter, auxiliary converter etc. - Provision of Linear Heat Detector (LHD) cables (UL or EN approved).…. ..... These standards may be referred for details of Smoke/Fire detection time, Positioning and commissioning of the system etc. The system to be capable of detecting smoke / fire along with its location at incipient stage of fire. ..... All the major events (alarms, faults etc.) to be recorded in the detection system and should be retrievable on maintenance terminal for analyzing any issue. The System shall be designed for self-diagnostic to any	Please clarify the "etc" in mentioned clause.	To be discuss during design stage.

S. No.	Part no /Section No..	Clause No.	Clause Description	Clarifications/Suggestions of M/s. Siemens	RDSO reply
			failure/trouble within The System i.e. wiring break within the system, discontinuity in the circuit etc. The Supplier/OEM shall provide necessary diagnostic tools (software, hardware etc.) in order to identify failures immediately.		
13.	Draft RDSO specification No. RDSO/ PE/ SPEC/EMU/ 0196-2024 (Rev.1)	3.5.6	The fully loaded 16-car rake with one basic unit isolated and already running continuously at sectional speed shall be capable of starting on a gradient of 1 in 37 and clear the section of 10 Km with speed up to 60 kmph….	Please clarify on sectional speed and what section would be considered (10km?) here?	Please refer modified clause no. 3.5.6
14.	Draft RDSO specification No. RDSO/ PE/ SPEC/EMU/ 0196-2024 (Rev.1)	4.1.1 (xxvii)	Light system including coach lights, Headlight, Tail-light, Marker lights and Flasher lights, Disaster Management Light and Signal Exchange Light **etc**. including control switchgear, switches with necessary terminal board thereof.	Please clarify the "etc" in mentioned clause.	To be discussed in design stage
15.	Draft RDSO specification No. RDSO/ PE/ SPEC/EMU/ 0196-2024 (Rev.1)	4.1.1 (xxxx)	3-phase to single phase underslung transformer of adequate capacity for auxiliary loads (not less than 20 kVA rating) generally conforming but not limited to ICF specification no. ICF/Elec/160 Rev 0 or latest. Further,3-phase to 3-phase isolation transformer/t ransformers (Y-Y, 415 V – 415V with neutral on secondary side) of adequate capacity around 80	Please share the load details (rating, power factor etc) to be fed by 80 kVA transformer under pantry loads.	Details are available with PUs and will be shared during detailed design stage.

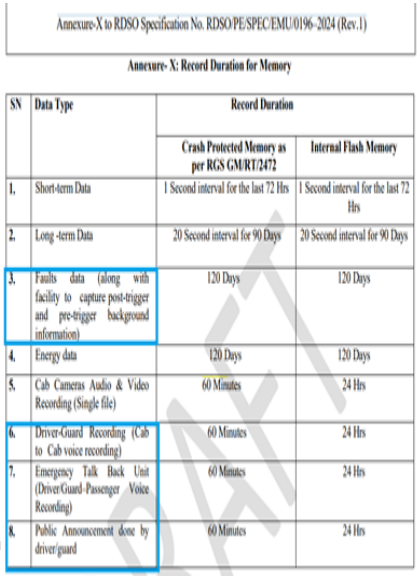
S. No.	Part no /Section No..	Clause No.	Clause Description	Clarifications/Suggestions of M/s. Siemens	RDSO reply
			KVA to cater the pantry loads of around 80 kVA operating at 415 V and 230 V shall be provided broadly conforming to RDSO specification No. RDSO/PE/SPEC/AC/0080-2007 (Rev.3) or latest		
16.	Draft RDSO specification No. RDSO/ PE/ SPEC/EMU/ 0196-2024 (Rev.1)	4.1.1 (xxxx)	3-phase to single phase underslung transformer of adequate capacity for auxiliary loads (not less than 20 kVA rating) generally conforming but not limited to ICF specification no. ICF/Elec/160 Rev 0 or latest. Further,3-phase to 3-phase isolation transformer/ transformers (Y-Y, 415 V – 415V with neutral on secondary side) of adequate capacity around 80 KVA to cater the pantry loads of around 80 kVA operating at 415 V and 230 V shall be provided broadly conforming to RDSO specification No. RDSO/PE/SPEC/AC/0080-2007 (Rev.3) or latest	As per clause 5.1 of RDSO/PE/SPEC/AC/0080-2007 (Rev.3), its mentioned that max speed of coaches can go upto 200kmph. Please clarify whether the speed to be considered as 160 kmph.	Please refer clause no. 2.5 for speed of train.
17.	Annexure XIII of Draft RDSO specification No. RDSO/ PE/ SPEC/EMU/ 0196-2024 (Rev.1)	4.1.1 (xxxx)	..... Further, 3-phase to 3-phase isolation transformer/transformers (Y-Y, 415 V – 415V with neutral on secondary side) of adequate capacity around 80 KVA to cater the pantry loads of around 80 kVA operating at 415 V and 230 V shall be provided broadly conforming to RDSO	Please clarify, do we need to provide the 415V output with neutral, 415 & 230 loads can be feed from the same secondary winding. We understand as per clause 2.10.1 of specification, IP65 is considered for supply of 80kVA	a. Understanding is broadly correct. However, details of loads of pantry car will be shared and discussed during detailed design stage for type of output supply. b. IP requirement mentioned in the RDSO specification No. RDSO/PE/SPEC/AC/0080-2007

S. No.	Part no /Section No..	Clause No.	Clause Description	Clarifications/Suggestions of M/s. Siemens	RDSO reply
			specification No. RDSO/PE/SPEC/AC/0080-2007 (Rev.3) or latest	aux transformer.	(Rev.3) or latest would be followed for isolation transformer. Please also refer clause no. 2.10.1
18.	Draft RDSO specification No. RDSO/ PE/ SPEC/EMU/ 0196-2024 (Rev.1)	4.5.8	…..The short time rating/thermal rating as specified herein of the equipment should be resorted only in emergency condition and will not be exceeded under such operation…..	IEC 61287 doesn't mention how to define the short term rating of the Traction System. Please specify the requirement of short term rating.	Based on emergency conditions, short term rating it may be defined. Therefore, No change in specification is envisaged.
19.	Draft RDSO specification No. RDSO/ PE/ SPEC/EMU/ 0196-2024 (Rev.1)	4.6.9	Maximum temperature rise of traction motor winding shall be limited to Ti – 70°C, considering 25% choking of filters. Thermal simulation of temperature rise in stator and rotor (if wound) with given duty cycle of the train operation shall be carried out to establish maximum temperature rise, which shall be within Ti – 70°C. The temperature rise in stator and rotor winding shall be validated through physical measurement on traction motors during the Type Tests. In case of cage rotor, temperature rise of cage rotor should not endanger any winding or any other parts like bearings etc. and the acceptable limit of temperature rise of cage rotor to be declared by propulsion supplier.	In case of cage rotor, measurement of the resistance of the rotor winding is not possible, Please clarify the requirement. IEC 60349-2 does not define the methods to calculate the temperature rise for the rotor.	Temperature at various parts of cage rotor may be recorded and temperature rise for the motor can be calculated through it. Hence, no change in specification is envisaged.
20.	Draft RDSO specification No. RDSO/ PE/ SPEC/EMU/ 0196-2024	4.6.10	The motor will be designed such that the "hot spot" temperature under conditions such as one	In case of cage rotor, measurement of the resistance of the rotor winding is not	Temperature at various parts of cage rotor may be recorded and temperature rise for the motor can

S. No.	Part no /Section No..	Clause No.	Clause Description	Clarifications/Suggestions of M/s. Siemens	RDSO reply
	(Rev.1)		hour, short-time and continuous rating of loading in any winding (stator and rotor) does not exceed the average temperature of that winding measured by resistance method by more than 20°C. For encapsulated design of traction motors lower limit of hot spot temperature can be accepted.	possible, Please clarify the requirement. IEC 60349-2 does not define the methods to calculate the temperature rise for the rotor.	be calculated through it. This interpretation is inherent in the clause. Hence, no change in specification is envisaged.
21.	Draft RDSO specification No. RDSO/ PE/ SPEC/EMU/ 0196-2024 (Rev.1)	4.6.23 (i)	Waterproofing tests: Waterproofing test will be conducted on Traction Motor along with Gear case ((without bull gear, axle, roller bearing, sealing rings and other attached part) by dipping it up to a height equivalent to 203 mm from rail level (under fully wheel worn condition) in stationary water for 12 hours. The motor shall function normal after the test. Following test parameters shall be recorded: a) Insulation resistance before immersion test b) Insulation resistance after immersion test c) Visual inspection regarding seepage of water inside and motor	In case the motor mounted above the water level calculated as per the conditions defined by the 4.6.23, this test should be optional.	No change in specification is envisaged.
22.	Draft RDSO specification No. RDSO/ PE/ SPEC/EMU/ 0196-2024 (Rev.1)	4.6.23 (i)	Waterproofing tests: Waterproofing test will be conducted on Traction Motor along with Gear case ((without bull gear, axle, roller bearing, sealing rings and other attached	In case the motor & gearbox are seperated by coupling it should be allowed to test the motor and gear box seperatly.	As motor and gear box shall be rotated together during the test.

S. No.	Part no /Section No..	Clause No.	Clause Description	Clarifications/Suggestions of M/s. Siemens	RDSO reply
			part) by dipping it up to a height equivalent to 203 mm from rail level (under fully wheel worn condition) in stationary water for 12 hours. The motor shall function normal after the test. Following test parameters shall be recorded: a) Insulation resistance before immersion test b) Insulation resistance after immersion test c) Visual inspection regarding seepage of water inside and motor		
23.	Draft RDSO specification No. RDSO/PE/ SPEC/EMU/0196-2024 (Rev.1)	4.8.4	……. The diagnostic system shall be able to identify and log the faults of the Train and such data (including energy data) shall be stored for the duration of the storage for the memory shall be considered as per Annexure-XII ……	Provided reference Annexure XII is seems not correct. Kindly clarify.	Please refer modified clause no. 4.8.4
24.	Draft RDSO specification No. RDSO/ PE/ SPEC/EMU/ 0196-2024 (Rev.1)	4.8.16	For control functions integrated in the TCMS, the requirements of EN 50126 and EN 50128 shall be applied. In particular, the risks associated with the integration of any control function shall be assessed and the design of the TCMS (SIL according to level according to EN 50128) shall reflect the level of risk identified. The functionalities indicated as under (but not limited to) shall be minimum SIL2 Compliant for	KAVACH has Speed indication which is SIL2 and it is not necessary to again have SIL2 Speed indication through TCMS. KAVACH also has Rollback detection and hence it is also not required through TCMS. EN 50657 is created in place of EN 50128 for software development in rolling stock application keeps the same	Kavach implementation is still under process and also may not cover all situations of speed control. No change in specification is envisaged. Please also refer modified clause no. 4.8.16.

S. No.	Part no /Section No..	Clause No.	Clause Description	Clarifications/Suggestions of M/s. Siemens	RDSO reply
			below defined vital and safety related control & monitoring functions: 1) Emergency brake 2) Standstill detection 3) Vigilance control 4) Speed control 5) Roll back detection 6) Speed indication 7) Traction release 8) Smoke and Fire detection Independent safety audit or safety assessment by an accredited agency shall be done for above functionalities for validation and certification of SIL levels according to prevailing EN standards and international practices. TCMS system shall provide for real time distributed control and modular processing of Sub-systems in a redundant manner with high reliability and availability. The Train control bus and the Train controller shall be redundant.	structure as EN 50128. So Siemens recommend to keep an alternate provision for software development as per EN 50657.	
25.	Draft RDSO specification No. RDSO/ PE/ SPEC/EMU/ 0196-2024 (Rev.1)	4.8.25 4.16.1 (xiii)	It shall be possible to read and record the energy consumption and regeneration figures for a particular time period for the individual basic unit and for the complete rake, along with train no., the name of the driver, date, time, distance, **journey details** etc. ..... …....The authorized person shall	Please clarify, the understanding of "journey details, etc" in the mentioned clauses.	To be discussed during design stage

S. No.	Part no /Section No..	Clause No.	Clause Description	Clarifications/Suggestions of M/s. Siemens	RDSO reply
			have to `log in' by means of suitable electronic device in the driver's cab and the details of the personnel and timing, **journey details** etc. …….		
26.	Draft RDSO specification No. RDSO/ PE/ SPEC/EMU/ 0196-2024 (Rev.1)	4.9	The duration of the storage for the memory shall be considered as per Annexure-X….  Annexure-X to RDSO Specification No. RDSO/PE/SPEC/EMU/0196-2024 (Rev.1) **Annexure- X: Record Duration for Memory**	1. Fault data with pre and post trigger recording: Managing fault with pre & post trigger recording needs complex solution (TCMS needs implement complex logic to send the pre & post trigger). Also extract & view this data from EVR is not possible, separate tool be created. Proposal: Only critical fault data shall be recorded in the EVR without pre & post trigger. 2. 3 Audio recording: • Driver-Guard Recording (Cab to Cab voice recording) • Emergency Talk Back Unit • Public Announcement done by driver/guard Data recording strategy (Live audio stream or Post call completion) is not defined in the specification.	Please refer modified Annexure-IX of specification.
27.	Draft RDSO specification No. RDSO/ PE/ SPEC/EMU/ 0196-2024 (Rev.1)	4.10.1	The Train shall provide a public address (PA) facility so that the Train Driver /Guard can make announcement to the passengers	Live / pre-recorded announcements shall be broadcasted to entire train or shall be Coach wise	Train wise broadcasting is generally allowed. However when required, coach wise broadcasting shall also be possible.

SN	Data Type	Record Duration	
		Crash Protected Memory as per RGS GM/RT/2472	Internal Flash Memory
1.	Short-term Data	1 Second interval for the last 72 Hrs	1 Second interval for the last 72 Hrs
2.	Long -term Data	20 Second interval for 90 Days	20 Second interval for 90 Days
3.	Faults data (along with facility to capture post-trigger and pre-trigger background information)	120 Days	120 Days
4.	Energy data	120 Days	120 Days
5.	Cab Cameras Audio & Video Recording (Single file)	60 Minutes	24 Hrs
6.	Driver-Guard Recording (Cab to Cab voice recording)	60 Minutes	24 Hrs
7.	Emergency Talk Back Unit (Driver/Guard-Passenger Voice Recording)	60 Minutes	24 Hrs
8.	Public Announcement done by driver/guard	60 Minutes	24 Hrs

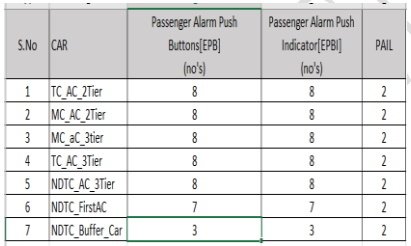
S. No.	Part no /Section No..	Clause No.	Clause Description	Clarifications/Suggestions of M/s. Siemens	RDSO reply
			from driving / non-driving cab. When public address (PA) enabled from guard, announcement shall perform only in passenger area and not in driver's cabin.	broadcasting ?	Please also refer modified clause no. 4.11.13
28.	Draft RDSO specification No. RDSO/ PE/ SPEC/EMU/ 0196-2024 (Rev.1)	4.10.4	The CCTV camera of the coach shall focus on the ETB area during the conversation.	As per our understanding the CCTV cameras installed in coaches are fixed camears and during ETB operation the particular camera having the view of the pressed ETB will be displayed on the CCTV HMI. As per RDSO/SPN/TC/106/2022 (Version No. 2.1 or Latest) the cameras are fixed, so focussing (zooming) at a particular point during ETB operation is not possible. Also as per annexure X - Addendum/Corrigendum to RDSO Telecom Directorate Specification No. RDSO/SPN/TC/106/2022 (Version No. 2.1) for Train Set Type Rakes: clause 2.9 (new clause) 2 nearby cameras have to be displayed on CCTV HMI. Kindly clarify ?	The Camera recording the ETB in service is to be shown on the driver desk. Details can be discussed during design stage. However, please also refer modified clause no. 4.12.1 for latest version of CCTV specification no. RDSO/SPN/TC/106/2025 (Version 3.0 or latest) for requirement of CCTV
29.	Annexure-XIII of RDSO specification No. RDSO/PE/SPEC/EMU/0196-2024 (Rev. 1)	4.11.4	Passenger information LCD displays with backlit LED boards shall be provided in each Car (minimum-1 no. for each cabin in First Class AC and minimum-2 no. for AC 2-Tier & AC 3-	As per ICF specification No. ICF/Elec/961 Revision 0 dated 23.12.17 section 3.2 scope of supply says 4 nos of LCD/LED displays (22-28") per coach which is contradictory to size	PUs has to clarify the scope of supply during tender stage. However, please also refer modified clause no. 4.11.4 of Annexure-XII

S. No.	Part no /Section No..	Clause No.	Clause Description	Clarifications/Suggestions of M/s. Siemens	RDSO reply
			Tier).These displays shall show current location of the Train, next station, time to next station, next interchange points, running speed, platform side, passenger related safety information. Provision should be made to display any other information such as pictures/video messages for advertisement or other purposes. Infotainment generally as per but not limited to ICF specification No. ICF/Elec/961 Revision 0 dated 23.12.17 is part of the scope of Supplier. Wi- Fi based infotainment system integrated with PIS Display shall be accessible for all passengers as per good industry practices. The system shall be suitable for rolling stock application. It should be possible for uploading pre-Loaded content for the route complete Trainset from a centralized location. Wi-Fi based system shall have provision of internet support, which can be enabled whenever the system is connected to external internet service. Passengers should be able to access the content from hand held devices. Approximate size of displays will be minimum 18.5". The size of the letter and resolution shall be programmable	and quantity mentioned in the clause 4.11.4. Kindly clarify ?	

S. No.	Part no /Section No..	Clause No.	Clause Description	Clarifications/Suggestions of M/s. Siemens	RDSO reply
			and have adequate clarity and visibility for all the passengers of the Car. The station names sha---- ----------		
30.	Annexure-XIII of RDSO specification No. RDSO/PE/SPEC/EMU/0196-2024 (Rev. 1)	4.11.5	Each driving coach shall be provided with a front destination indicator board (Head Code) for good visibility in day and night of suitable size. Each Car shall be provided with two digital destination boards (minimum size- 128 x 16) of good visibility in day and night on the outside (one on each side) displaying the originating, destination station, Car number, Train number etc. Additionally, each Car shall have two exclusive LED matrix Single Side Display boards (minimum size- 144x16) to be provided above the doorway (IC doors) inside each coach of the rake in order to show the information to the passengers sitting inside the coach like the following: Name of approaching station Current and next Halting Station Time to next stations Running speed Platform side Safety Messages Late running status Approximate distance to next station	Kindly clarify if any data/power redundancy is envisaged in the Digital display boards, Front Destination indicator and in coach displays? Further LED matrix of 128x16 will not be applicable for digital boards. Kindly update the clause accordingly.	Data and power redundancy is to be ensured, which will be discussed in design stage. Two LED matrix destination boards (minimum size- 128 x 16) on the outside (one on each side) of the coach has to be provided. Please also refer modified Annexure-XII

S. No.	Part no /Section No..	Clause No.	Clause Description	Clarifications/Suggestions of M/s. Siemens	RDSO reply
			The mounting of the boards will be within the recess in the car body and suitably covered with glass. Digital Display Boards should be integrated with coach Body design.		
31.	Draft RDSO specification No. RDSO/ PE/ SPEC/EMU/ 0196-2024 (Rev.1)	4.11.13	The PIS system provided shall be capable of automatically providing audio announcements that are triggered as part of the Exterior Door obstacle detection sequence. This message shall be audibly broadcast in the affected Vestibule and a suitable visual indicator to be provided for indicating the status adjacent to the Exterior Door.	We propose that the audible broadcast for door status shall be made in the full coach rather than the particular vestibule area. Otherwise for making announcement in a particular vestibule area, it shall be differentiated as a separate zone in the PA system fed from different amplifier.	Information broadcast/display to passenger regarding obstacle detection at the door through PAPIS in concerned coach including vestibule so that corrective action could be taken. Please refer modified clause no. 4.11.13
32.	Draft RDSO specification No. RDSO/ PE/ SPEC/EMU/ 0196-2024 (Rev.1)	4.13.1	There should be provision of recording the voice of driver & Guard (both) in the memory for the duration as per Annexure-X of Event Recorder described in clause 4.9. Mic provided on the driver desk shall be made use of, for this purpose. In the CCTV network, One separate and independent camera with inbuilt microphone in each cab shall be installed at appropriate location to clearly make out various actions (audio & video) of crew in these cab cameras or recording in the memory for the duration as per Annexure-X.	It is duly noted that the microphone provided on the driver's desk will suffice for recording the voices of both the driver and guard. Hence, the requirement of an additional camera with a built-in microphone is redundant. A separate camera without a microphone would adequately fulfill the requirement.	This is for better redundancy and better clarity. No change in the specification is envisaged. However, please also refer the modified clause no. 4.13.1

S. No.	Part no /Section No..	Clause No.	Clause Description	Clarifications/Suggestions of M/s. Siemens	RDSO reply
33.	Draft RDSO specification No. RDSO/ PE/ SPEC/EMU/ 0196-2024 (Rev.1)	4.16.1 (iii)	..... Cab-equipment shall also include **pneumatic horns(on both sides of the desk)**, electric motor driven wind screen wipers (wiper should have wind screen washer & control as well), **rolling blinds, sun-visors**, tail light, safety related equipment like bell code system, flasher light control unit and speedometer-cum-recorder.....	RDSO clause 4.16.1 (iii) states that driving cab shall include Pneumatic horns, rolling blind and Sun visors. We understand that these are not in suppliers scope. Please clarify.	Scope of supply to be decided by PUs.
34.	Draft RDSO specification No. RDSO/ PE/ SPEC/EMU/ 0196-2024 (Rev.1)	4.16.1 (xi)	All the equipment viz indication and instruments, panels, switches, ventilation control system, lighting, driver and guard seat, sunscreens and gauges **etc.** required to be installed in the cab, shall be supplied by the Supplier except for TPWS/ATP/KAVACH/RTIS equipment and Auto Brake Controller, which shall be supplied by the Purchaser.	Please clarify the "etc" in mentioned clause.	To be discussed in design stage
35.	Annexure XIII of Draft RDSO specification No. RDSO/ PE/ SPEC/EMU/ 0196-2024 (Rev.1)	4.20.1	The coaches shall be equipped with an audio/visual passenger alarm system. One special extra large size alarm pushbuttons shall be provided in each compartment of the Car for easy identification and access for the passengers. Each Car shall be provided with	This indicates the Emergency Push Buttons (EPB) along with Emergency push button indicators (EPBI) in the layout ? PAIL (Passenger Alarm Indicator Lamp) is for both sides of the car ? Please confirm the following	Please refer modified clause no. 4.20.1 However, for the quantity and location in coach layout PUs may decide.

<table>
<tr><th>S. No.</th><th>Part no /Section No..</th><th>Clause No.</th><th>Clause Description</th><th>Clarifications/Suggestions of M/s. Siemens</th><th>RDSO reply</th></tr>
<tr><td></td><td></td><td></td><td>the following:
- flush mounted alarm push mechanism with integrated dual LEDs to indicate the system is ok and alarm system activated anywhere in the coach,
- flush mounted LED based Alarm indicator on each side of the coach,</td><td>buttons & Indicators to be provided per coaches
 
<table>
<tr><th>S.No</th><th>CAR</th><th>Passenger Alarm Push Buttons[EPB] (no's)</th><th>Passenger Alarm Push Indicator[EPBI] (no's)</th><th>PAIL</th></tr>
<tr><td>1</td><td>TC_AC_2Tier</td><td>8</td><td>8</td><td>2</td></tr>
<tr><td>2</td><td>MC_AC_2Tier</td><td>8</td><td>8</td><td>2</td></tr>
<tr><td>3</td><td>MC_aC_3tier</td><td>8</td><td>8</td><td>2</td></tr>
<tr><td>4</td><td>TC_AC_3Tier</td><td>8</td><td>8</td><td>2</td></tr>
<tr><td>5</td><td>NDTC_AC_3Tier</td><td>8</td><td>8</td><td>2</td></tr>
<tr><td>6</td><td>NDTC_FirstAC</td><td>7</td><td>7</td><td>2</td></tr>
<tr><td>7</td><td>NDTC_Buffer_Car</td><td>3</td><td>3</td><td>2</td></tr>
</table></td><td></td></tr>
<tr><td>36.</td><td>Draft RDSO specification No. RDSO/ PE/ SPEC/EMU/ 0196-2024 (Rev.1)</td><td>4.27.2</td><td>The auxiliary system shall be designed in such a way that in the event of failure of auxiliary converter(s) equivalent to one basic unit, all the loads (including air conditioning) shall work normally. In case of failure of next auxiliary converter equivalent to one basic unit, all the loads (including air conditioning) shall work normally, the unit with failed auxiliary converter shall work with 50% air conditioning, 100 % fresh air ventilation and all other loads shall be fully available. In case one more auxiliary converter fails equivalent to one basic unit, all the loads (including air conditioning) shall work normally, air conditioning shall be switched off and all other loads including fresh air ventilation shall work normally.</td><td>As per requirement (in RDSO sepc rev 1), Aux power load calculation requirement should be submitted for 16 car rake. However, train formation for 16 car rake is not available. And we understand that auxiliary converter redundancy calculation to be done considering the train without pantry coach.</td><td>Please refer modified Annexure-XII of specification.</td></tr>
</table>

S. No.	Part no /Section No..	Clause No.	Clause Description	Clarifications/Suggestions of M/s. Siemens	RDSO reply
			The above-mentioned design rules shall be fulfilled with a 16-car rake with four 4-car basic units or higher.		
37.	Draft RDSO specification No. RDSO/ PE/ SPEC/EMU/ 0196-2024 (Rev.1)	4.27.13	Only insulation system of class 180°C or higher will be acceptable. The permitted temperature rise for different classes will be: Class 180°C:- 80°C Class 200°C:-100°C	Request to add below as option to requirement in clause 4.28.13 since fan/blower with new technology (Electronically commuted brushless DC motor) are available which gives better features such as better efficiency, low noise, high reliability, speed control and status monitoring. “For blower motors with BLDC/ PMSM or electronically commuted (EC) technology, insulation 155°C is acceptable provided - i. The permitted temperature rise is:- 55°C ii. MTBF of the Motor shall be minimum 250000 hours “	The clause pertains to large auxiliary systems and is not applicable to small auxiliary motors/BLDC motors. Hence, no change in specification is envisaged.
38.	Draft RDSO specification No. RDSO/ PE/ SPEC/EMU/ 0196-2024 (Rev.1)	4.28.3.1	The batteries shall be maintained at an adequate level of charge to satisfy the requirements of following Emergency Loads for a duration of 3 hours after the loss of OHE power: ..... (viii) Power requirements for maintaining vacuum/ power for Vacuum Toilets including water raising apparatus system and	Please provide details of "water raising apparatus system" and "pneumatic requirements for Vacuum Toilets" for adequate sizing of battery capacity.	Details will be shared during design stage.

S. No.	Part no /Section No..	Clause No.	Clause Description	Clarifications/Suggestions of M/s. Siemens	RDSO reply
			pneumatic requirements for Vacuum Toilets.		
	Draft RDSO specification No. RDSO/ PE/ SPEC/EMU/ 0196-2024 (Rev.1)	4.28.3.1	(ix) Integrated Berth reading light with 3 pin charging socket, its switches and USB type A and C fast charging panel and Night Light cum berth Indication Light.	Please exclude this requirement from battery emergency load since it has a huge impact on the battery capacity requirement.	Since it is a rare requirement, and this will unnecessarily increase size of battery, hence to avoid extra battery, carrying dead load of clause has been deleted. Please refer to modified clause no. 4.28.3.1
39.	Draft RDSO specification No. RDSO/ PE/ SPEC/EMU/ 0196-2024 (Rev.1)	4.38	Air-Conditioning System HVAC performance Duct design	As the complete car body including interior furnishing of the vehicle is not in the bidder's scope of supply, we are not in a position to estimate the HVAC capacity and the rating required for the various types of coaches to meet the cooling and heating requirements and performance thereof as specified in the technical specifications. In view of this we would request ICF to delete the entire HVAC system from the bidder's scope. Alternatively, request you to kindly specify the HVAC rating (cooling and heating capacity and commensurate electrical rating) to be supplied to meet the saloon environmental conditions/ performance requirements as specified in RDSO technical specifications. The Electrical interfacing with other electrics and TCMS can	PUs may decide during tender stage

S. No.	Part no /Section No..	Clause No.	Clause Description	Clarifications/Suggestions of M/s. Siemens	RDSO reply
				be discussed and agreed with ICF during the design stage. The AC duct design and supply being the integral part of the car body and interior furnishing which is not in bidder's scope, therefore we request that the design of AC duct is deleted from the bidder's scope of supply.	
40.	Draft RDSO specification No. RDSO/PE/ SPEC/EMU/ 0196-2024 (Rev.1)	4.38.1	All the Cars shall be air-conditioned with a minimum of two light weight Aluminium alloy or better material body roof mounted packaged unit (RMPU) type air conditioning units in each Car. ….....	Please clarify whether the housing material SS304 is considered as a "better material"?	Material suitability will be examined at design stage
41.	Draft RDSO specification No. RDSO/ PE/ SPEC/EMU/ 0196-2024 (Rev.1)	4.38.1	.....Both the compressors in each RMPU shall have automatic capacity control through hot gas bypass system or through VVVF control to optimize the efficiency of RMPU. ….....	Clause 4.38.1 & 4.38.14 are conflicting for both compressors in each RMPU shall controlled through VVVF.	Please refer modified clause no. 4.38.14
42.	Draft RDSO specification No. RDSO/ PE/ SPEC/EMU/ 0196-2024 (Rev.1)	4.38.1	.....Each packaged unit shall have two independent refrigerant circuits. It shall also be able to provide heating during winter through reverse cycle heating concept~~/ heaters~~**or alternate method based on suitability, proven technology and better efficiency.** The control of both the air-conditioning unit shall be performed by suitably designed	For heating during winter, reverse cycle concept will be adding more complexity to cooling circuit (which affects the reliability) and having limitation of working at lower temperature. Hence we request RDSO to allow heaters as an option during winter.	Description of the clause not as per specification. However, alternate method with proven technology and better efficiency for heating is already called for in the specification. Hence no change in the specification is envisaged.

S. No.	Part no /Section No..	Clause No.	Clause Description	Clarifications/Suggestions of M/s. Siemens	RDSO reply
			microprocessor controller.		
43.	Draft RDSO specification No. RDSO/ PE/ SPEC/EMU/ 0196-2024 (Rev.1) - Annexure XIII	4.42.1	.....Minimum distance between two pantographs should be as per EN 50367. Number of trains with following options "a" and "b" will be advised during execution as per requirement: a) Two of the Middle Basic Unit next to End Basic Unit should be high reach pantograph as per RDSO specification No. RDSO/2007/EL/SPEC/0054 (Rev.3) or latest with ADD and ORD. b) Four of the Middle Basic Units should be high reach pantograph as per RDSO specification No. RDSO/2007/EL/SPEC/0054 (Rev.3) or latest with ADD and ORD.	We understand that- In Option (a), if one High Rise panto fails than it will lead to failure on half train. In Option (b), if one Low Rise panto fails than it will lead to failure on half train. Also interchangeability of similar type of cars (as requested in clause 1.3.11) is not possible if the cars are fitted with different type of pantographs. Please clarify.	High rise pantograph shall be supplied as per SOR. PUs will decide where it is to be fitted.
44.	Draft RDSO specification No. RDSO/ PE/ SPEC/EMU/ 0196-2024 (Rev.1)	4.43	CCMS shall also run diagnostic routines on the AC plant and generate alerts like low gas pressure in compressors, faulty sensors etc. Status/Health of Other functionalities viz. CCTV, PIS etc. and automatic voice announcement system shall also be available in CCMS. Details shall be finalized at design stage.....	Please clarify what other systems other than HVAC, CCTV, PIS are to be monitored in CCMS HMI ? Please also clarify the "etc" for both the cases in mentioned clause (4.43). Please also clarify "Other inputs and output" mentioned in clause 4.43(iii)	a. It is clarified that passenger announcement is part of PA/PIS system. Hence health status of CCTV and PA/PIS is required. b. Health/ Status of All systems where passenger comfort is involved are to be shown in CCMS like lights, Doors, etc. c. Details will be discuss during design stage.

S. No.	Part no /Section No..	Clause No.	Clause Description	Clarifications/Suggestions of M/s. Siemens	RDSO reply
					Hence no change in the specification is envisaged.
45.	Draft RDSO specification No. RDSO/ PE/ SPEC/EMU/ 0196-2024 (Rev.1)	5.2.2	Oscillation trials (on prototype rake): Oscillation Trials for determining Vehicle….....	Please clarify that Mechanical items like car body, coach furnishing including bogie is not in bidder's scope of supply, so this clause is not applicable for the present tender.	It shall be applicable as per scope only
46.	Draft RDSO specification No. RDSO/ PE/ SPEC/EMU/ 0196-2024 (Rev.1)	5.12.1	The estimated specific energy consumption figures along with the break up as mentioned in above para of this clause, will be submitted by the Supplier for each section based on the train resistance formula and track profile & permanent speed restrictions.	"along with the break up as mentioned in above para of this clause" is not applicable now as breakup is deleted from this clause	Please refer modified clause no. 5.12.1
47.	Draft RDSO specification No. RDSO/PE/SPEC/ EMU/0196-2024(Rev.1)	Annex 1 A 9	Traction Motor: The design shall include Continuous rating, One hour rating, Short term rating, gear ratio, traction motor characteristics under the environment and service conditions specified in the specifications and standards, estimated temperature rise of stator winding, air flow, ventilation to watt loss ratio, maximum designed test and service speed, details of insulation, details of the bearings, fits and clearances adopted, details of lubrications to be used in gear case and bearings, traction	Duration for the short term rating of the motor to be defined.	Based on emergency conditions, short term rating it may be defined. Therefore, no change in specification is envisaged.

S. No.	Part no /Section No..	Clause No.	Clause Description	Clarifications/Suggestions of M/s. Siemens	RDSO reply
			motor performance curves,		
48.	Draft RDSO specification No. RDSO/ PE/ SPEC/EMU/ 0196-2024 (Rev.1)	Annex 1 C 7. 31)	Traction motor cooling duct arrangement	Duct arrangement is not applicable for maintenance free self ventilated motor.	The clause will be applicable only if the Traction Motor design is approved with a duct
49.	RDSO/SPN/TC/106/2022 ver 2.1	2.5	The Cameras and Video Recorder Unit / Mobile NVR of running trains shall be accessible on real time basis through available Wi-fi and LTE network as and when required from Data Centre / Centralized locations / Clients for Viewing, Monitoring and Alarms.	Our understanding here is that LTE Sim cards and its associated monthly charges are in scope of Indian Railways. Please confirm ?	Non-technical issue. SIM may be considered to be provided by Propulsion supplier. However recurring monthly charges may be given by Zonal railways. However since it is related to scope of supply, be decided by the purchaser. Please also refer modified clause no. 4.12.1 for latest version of CCTV specification no. RDSO/SPN/TC/106/2025 (Version 3.0 or latest) for requirement of CCTV
50.	RDSO/SPN/TC/106/2022 ver 2.1	2.7	(i) There shall be provision of Panic Button I Buttons in each Coach. Pressing Panic Button shall provide local buzzer as well as alarm to the Data Centre I Centralized location through available network for CCTV application.	Location & number of panic button to clarified for each type of car. We propose that instead of installing seprate panic buttons the passenger alarm buttons installed in coaches can be integrated with CCTV system to provide local buzzer and alarms to data centre.	Please refer modified clause no. 4.12.1 for latest version of CCTV specification no. RDSO/SPN/TC/106/2025 (Version 3.0 or latest) for requirement of CCTV
51.	RDSO/SPN/TC/106/2022 ver 2.1	3.8.1	Central Management System (CMS) including Video Management Software (VMS) and/or Command Control Centre	Please clarify our understanding that CMS server and software is in the scope of supplier and further there is no requirement	Please refer modified clause no. 4.12.1 for latest version of CCTV specification no. RDSO/SPN/TC/106/2025 (Version

S. No.	Part no /Section No..	Clause No.	Clause Description	Clarifications/Suggestions of M/s. Siemens	RDSO reply
			(CCC) Software shall be deployed in Datacenter / Centralized Location or Locations / Cloud or any other location as specified by the purchaser.	of integrating the CMS with CRIS server or software. Also as per our understanding, network and hardwares (workstation/laptop) to view the CMS application in control centre is not in the scope of supplier. Please clarify?	3.0 or latest) for requirement of CCTV
52.	RDSO/SPN/TC/106/2022 ver 2.1	3.8.5	Central Management System shall have a dashboard to display status of all requests pertaining to video footage by various RPF Thana/Post. CMS shall also provide a dashboard to respective RPF Thana/Post displaying status (in-progress/completed) of the requests created by that RPF Thana/Post	Please clarify the number of RPF thana / post on which the software has to be provided. Also as per our understanding, network and hardwares (workstation/laptop) to view the CMS application in RPF thana / post is not in the scope of supplier. Please clarify?	Please refer modified clause no. 4.12.1 for latest version of CCTV specification no. RDSO/SPN/TC/106/2025 (Version 3.0 or latest) for requirement of CCTV
53.	RDSO/SPN/TC/106/2022 ver 2.1	3.17	For RPF personnel &TCmEs, if required, Body Worn Camera may be procured by the concerned department as per the technical specification issued by Security Directorate, Railway Board. It should be feasible to integrate such cameras over IP protocol with the existing Video Surveillance System for live feed & data records.	Our understanding that these devices shall integrate with NVR through wireless interface inside the coach only for live feed or data records. Please clarify. Also the Body worn cameras shall be open protocol ONVIF-S compliant.	Please refer modified clause no. 4.12.1 for latest version of CCTV specification no. RDSO/SPN/TC/106/2025 (Version 3.0 or latest) for requirement of CCTV
54.	RDSO/SPN/TC/106/2022 ver 2.1	4.2 xii	Mobile Communication - Inbuilt or external (within the housing as per clause no. 3.16) L TE Mobile communication with standard SIM Card slot with external	It is understood that only one SIM card slot is required in one NVR. Also we understand from existing requirements that that data connectivity between CRIS	Please refer modified clause no. 4.12.1 for latest version of CCTV specification no. RDSO/SPN/TC/106/2025 (Version 3.0 or latest) for requirement of

S. No.	Part no /Section No..	Clause No.	Clause Description	Clarifications/Suggestions of M/s. Siemens	RDSO reply
			antenna. Nole: e-SIM in place of standard SIM Card slot shall also be acceptable il full functionality is achieved.	and NVR has been specified as 5G dual sim aggregated. Kindly advise if 5G is permitted or dual radio 5G agrregated band width is needed.	CCTV.
55.	RDSO/SPN/TC/106/2022 ver 2.1	4.9.6	..... Access to central server shall be provided for data download and analysis, the cost of which shall be borne by IR beyond warranty period. However, configuring the server and cost of access as needed during warranty period shall be in the scope of supplier for 2 different geographical locations	Datacenter i.e. Server, Operating System, Network, Application software, Power supplies, etc (that also fultills the cyber security requriements of this tender) will be in scope of purchaser. Our understanding here is that the GSM-R Sim cards for remote diagnostic and tracking equipment and its associated recurring charges are in scope of Indian Railways. Please confirm ?	Please refer modified clause no. 4.12.1 for latest version of CCTV specification no. RDSO/SPN/TC/106/2025 (Version 3.0 or latest) for requirement of CCTV
56.	RDSO/SPN/TC/106/2022 ver 2.1	4.7.10.9	Face recognition mobile application for android and IOS mobile • The FRS system shall have Android and lOS Mobile Application for Facial Recognition Purpose. • Mobile App API shall be provided for third party app integration.	We request to kindly clarify the scope of the supplier for mobile application.	Please refer modified clause no. 4.12.1 for latest version of CCTV specification no. RDSO/SPN/TC/106/2025 (Version 3.0 or latest) for requirement of CCTV
57.			Additional Query - Underframe layouts	We request to please provide underframe layouts with component locations (for car builer scope) for all car types	Details will be provided during design stage.

S. No.	Part no /Section No..	Clause No.	Clause Description	Clarifications/Suggestions of M/s. Siemens	RDSO reply
				inclusive of seater and sleeper trains.	
58.			Additional Query - Interface elements of Motor and Bogie	Propulsion Supplier scope has traction motor & gear box which will be mounted inside the bogie. Bogie manufacturer is the integrator of the traction Motor & gear box inside bogie. Hence Siemens recommends to place interface elements in the scope of bogie supplier for both motor & gear box, as calculations and validation will be performed by the bogie supplier.	Query not related to technical specification.

ICF/Electrical comments received vide letter dated 03.05.2024 on RDSO specification RDSO/SPEC/PE/EMU/0196/Rev.01-2024

S. No	Clause no.	Existing Description	To be modified as	ICF Remarks reference.	RDS comments
1.	2.1.1	The tentative layouts of sleeper version of coaches to be provided by PUs.	The tentative layouts of sleeper version of coaches ~~to be provided by PUs~~. ***as per Annexure VIII A for reference.***	***Annexure VIII A to be attached by mech design (tentative layouts for sleeper)***	Coach layout drawings to be provided by ICF/PUs
2.	2.4.1	In this Clause, the references to Group A, Group B, Group C, Group D and Group E mean the following: (i) Group A: Speeds up to 160km/h. (ii) Group B: Speeds up to 130km/h. (iii) Group C: Suburban sections	In this Clause, the references to Group A, Group B, Group C, ***Group D spl*** , Group D and ***Group E*** mean the following: (i) Group A: Speeds up to 160km/h. (ii) Group B: Speeds up to 130km/h. (iii) Group C: Suburban sections	Reference: Clause 2.4.1 of Specification No. RDSO/PE/SPEC/EMU/0196–2019 (Rev.0)	Please refer modified clause no. 2.4.1

		of Mumbai, Delhi, Chennai and Kolkata. (v) Group 'D': Speeds up to 110 kmph.	of Mumbai, Delhi, Chennai and Kolkata. ***(Iv) Group D spl: Speeds upto 110 kmph and the annual traffic density is 20 GMT or more*** (v) Group 'D': Speeds up to 110 kmph. ***and the traffic density is less than 20 GMT*** ***(v) Group 'E': All other sections and branch lines with speeds up to100 km/h.***		
3.	2.4.2	Trains shall be designed to operate on Indian Railways Broad Gauge track having 1676 mm nominal gauge and tolerances as specified in IRPWM June2020 (with latest amendment). For conducting oscillation trial on speed above 110 kmph, the trial shall be conducted with instrumented wheel for measurement of lateral force at rail wheel level and instantaneous vertical wheel load.	Trains shall be designed to operate on Indian Railways Broad Gauge track having 1676 mm nominal gauge and tolerances as specified in IRPWM June2020 (with latest amendment). For conducting oscillation trial on speed above ~~110~~***130***kmph, the trial shall be conducted with instrumented wheel for measurement of lateral force at rail wheel level and instantaneous vertical wheel load.	Reference: Clause 2.4.1 of Addendum/ Corrigendum to RDSO specification No.: RDSO/PE/SPEC/EMU/0196-2019 (Rev. 0) based on Pre Bid queries Pre Bid meeting held at ICF on 23.01.2020	Please refer modified clause no. 2.4.2
4.	2.9.2	A reliable Automatic fire detection and alarm system shall be provided, in accordance with Clause 4.18 of this specification covering the following areas: ……	A reliable Automatic fire detection and alarm system ***(with SIL2 compliant hardware)*** shall be provided, in accordance with Clause 4.18 of this specification coveringthe following areas: ……	Reference: Clause 2.9.2 of Addendum/ Corrigendum to RDSO specification No.: RDSO/PE/SPEC/EMU/0196-2019 (Rev. 0) based on Pre Bid queries Pre Bid meeting held at ICF on 29.09.2020	Please refer modified clause no. 2.9.2

5.	4.8.4	**…….**The diagnostic system shall be able to identify and log the faults of the Train and such data (including energy data) shall be stored for the duration of the storage for the memory shall be considered as per Annexure-XII. Licensed application software shall be provided to facilitate the fault diagnosis and the analysis of equipment wise failures. The steps required for investigation to be done, shall be displayed in simple language along with the background information. Offered software shall be compatible for working with commercially available operating systems.	**…….**The diagnostic system shall be able to identify and log the faults of the Train and such data (including energy data) shall be stored for the duration of the storage for the memory shall be considered as per Annexure-~~XII~~***X.*** Licensed application software shall be provided to facilitate the fault diagnosis and the analysis of equipment wise failures. The steps required for investigation to be done, shall be displayed in simple language along with the background information. Offered software shall be compatible for working with commercially available operating systems.	Reference: Annexure-X to RDSO Specification No. RDSO/PE/SPEC/EMU/0196–2024 (Rev.1)	Please refer modified clause no. 4.8.4
6.	4.11.5 SL.NO-18 OF ANNEXURE-XIII	Each driving coach shall be provided with a front destination indicator board (Head Code) for good visibility in day and night of suitable size. Each Car shall be provided with two digital destination boards (minimum size- 128 x 16) of good visibility in day and night on the outside (one on each side) displaying the originating, destination station, Car number, Train number etc. Additionally, each Car shall have two exclusive LED matrix Single Side Display boards (minimum size- ***128*** ~~144~~x16) to be	Each driving coach shall be provided with a front destination indicator board (Head Code) for good visibility in day and night of suitable size. Each Car shall be provided with two digital destination boards (minimum size- 128 x 16) of good visibility in day and night on the outside (one on each side) displaying the originating, destination station, Car number, Train number etc. Additionally, each Car shall have two exclusive LED matrix Single Side Display boards (minimum size- ***128*** ~~144~~x16) to be provided above the ~~doorway~~		Please refer modified clause Annexure-XII, clause no. 4.11.5

		provided above the doorway (IC doors) inside each coach of the rake in order to show the information to the passengers sitting inside the coach like the following: ➢ Name of approaching station ➢ Current and next Halting Station ➢ Time to next stations ➢ Running speed ➢ Platform side ➢ Safety Messages ➢ Late running status ➢ Approximate distance to next station The mounting of the boards will be within the recess in the car body and suitably covered with glass. Digital Display Boards should be integrated with coach Body design.	~~(IC doors)~~ inside each coach ***(location to be finalized during the detail design stage)*** of the rake in order to show the information to the passengers sitting inside the coach like the following: ➢ Name of approaching station ➢ Current and next Halting Station ➢ Time to next stations ➢ Running speed ➢ Platform side ➢ Safety Messages ➢ Late running status ➢ Approximate distance to next station The mounting of the boards will be within the recess in the car body and suitably covered with glass. Digital Display Boards should be integrated with coach Body design.		
7.	4.26.3 (To be added in ANNEXURE-XIII)	In normal condition, 16-car Train shall work on two Pantographs. For this purpose, HT cable shall be laid on roof with suitable flexible inter-vehicle connections between adjacent coaches. This cable shall be suitably protected against insulation failure/ earth leakage and isolation through VCB shall be provided to avoid repeated tripping of feeding Traction substation	In normal condition, ~~16~~*24*-car Train shall work on two Pantographs. For this purpose, HT cable shall be laid on roof with suitable flexible inter-vehicle connections between adjacent coaches. This cable shall be suitably protected against insulation failure/ earth leakage and isolation through VCB shall be provided to avoid repeated tripping of feeding Traction substation		Please refer modified Annexure XII, clause no. 4.26.3

8.	4.27.18	……..Auxiliary compressor for pantograph shall be supplied as a module duly including - Aux. Compressor-1, safety valve -1, check valve -2, pressure switch -1, Air Filter -1, 25 L Reservoir -1, Isolating cocks-2. Any modification in the existing pneumatic control circuit shall not normally be preferred. However, if it becomes inevitable due to any design up gradation of the equipment	……..Auxiliary compressor for pantograph shall be supplied as a module duly including - Aux. Compressor-1, safety valve -1, check valve -2, pressure switch -1, Air Filter -1, ~~25 L~~*35L*Reservoir -1, Isolating cocks-2. Any modification in the existing pneumatic control circuit shall not normally be preferred. However, if it becomes inevitable due to any design up gradation of the equipment	RDSO may kindly review and decide on appropriate reservoir capacity to suit the satisfactory functioning of high raise panto also.	Please refer modified clause no. 4.27.18
9.	4.29.1	Lights shall be fed by the auxiliary power supply system. Total lights to be grouped into essential & normal lights. The guaranteed life of the LEDs with their control system and optics/luminaire shall not be less than 50000 burning hours. The specified illumination level shall be met till at the end of the life of 50,000 hours. After 50000 burning hours, the luminaire intensity shall be at least 70% with degree of uniformity as per EN 13272. The colour of the LEDs shall be cool day white (temperature 4000K 7000K). LED shall be LM80 certified for white LED along with TM 21 projection for more than 50000 hours. Separately protected	Lights shall be fed by the auxiliary power supply system. Total lights to be grouped into essential & normal lights. The guaranteed life of the LEDs with their control system and optics/luminaire shall not be less than 50000 burning hours. The specified illumination level shall be met till at the end of the life of 50,000 hours. After 50000 burning hours, the luminaire intensity shall be at least 70% with degree of uniformity as per EN 13272. The colour of the LEDs shall be cool day white (temperature 4000K 7000K). LED shall be LM80 certified for white LED along with TM 21 projection for more than 50000 hours. Separately protected		Please refer modified Annexure-XII, clause no. 4.29.1

		lighting circuits shall be used, such that in the event of tripping of one circuit, the others should provide evenly distributed lighting throughout the Car. The Supplier shall submit layout of fittings, control circuit and service life of LED lamp during the design stage which shall be as per the best international practices. It shall be possible to replace defective LEDs /block of LEDs with ease and minimum need for readjustments or otherwise. The Direct and Indirect light (diffused lights) to be provided and LED lights should be integrated with Coach Body design. ***Integrated Berth reading light with 3 pin charging socket, its switches and USB type A and C fast charging panel and Night Light cum berth Indication Light.***	lighting circuits shall be used, such that in the event of tripping of one circuit, the others should provide evenly distributed lighting throughout the Car. The Supplier shall submit layout of fittings, control circuit and service life of LED lamp during the design stage which shall be as per the best international practices. It shall be possible to replace defective LEDs /block of LEDs with ease and minimum need for readjustments or otherwise. The Direct and Indirect light (diffused lights) to be provided and LED Lights ***along with its switches*** should be integrated with Coach Body design. ***Integrated Berth reading light with 3 pin charging socket, its switches and USB type A and C fast charging panel and Night Light cum berth Indication Light.*** ***For validating the lux level provided by the lights : All the lights to be switched on in a bay (coupe/cabinet) and the lux value to be checked with the illumination and the same shall not be less than 200 lux at height of 1.5m above floor level.***		
10.	4.30.6 (NEW		***LED Head light shall confirm to***		New clause no. 4.31.6 has been added.

	CLAUSE)		***RDSO specification no : RDSO/2017/EL/SPEC/0134 (LATEST)***		
11.	4.31.1	LED type tail light shall also be provided on each Driving Car. Tail light shall be steady red on one side and flashing amber on the other side.	LED type tail light shall also be provided on each Driving Car. ~~Tail light shall be steady red on one side and flashing amber on the other side.~~		Please refer modified clause no. 4.31.1
12.	4.31.2	The tail light shall be amber in colour flashing at a rate of 55-65 flashes per minute in operation.	The tail light shall be ~~**amber**~~ ***red*** in colour flashing at a rate of 55-65 flashes per minute in operation.		Please refer modified clause no. 4.31.2
13.	4.31.3	The clear visibility of tail light in clear daylight shall not be less than 1.6 kilometres along the longitudinal axis and 100 meters at 6 degree angular displacement from longitudinal axis.	The clear visibility of tail light in clear daylight shall not be less than ~~**1.6**~~ ***2.0*** kilometres along the longitudinal axis ~~**and 100 meters at 6 degree angular displacement from longitudinal axis**~~**.** ***confirm to RDSO spec. ELRS/SPEC/PR/0022 (latest)***		Please refer modified clause no. 4.31.3
14.	4.32.2	Each twin marker light shall provide one white and one red array.	Each twin marker light shall provide one white and one red array. ***Red array marker light shall be considered as tail light as per clause 4.31.***		Please refer modified clause no. 4.32.2
15.	4.32.4	The marker lamp shall have a nominal light output of 40 lux at 1 meter.	The marker lamp shall ~~have a nominal light output of 40 lux at 1 meter~~. ***confirm to RDSO spec. ELRS/SPEC/PR/0022 (latest)***		Please refer modified clause no. 4.32.4
16.	Annexure I (7)	Auxiliary converter: Make and type, number of cubicles per motor coach, cooling system design details including air flow	Auxiliary converter: Make and type, number of cubicles per motor coach, cooling system design details including air flow	Reference: Annexure-I si.no-7 of Specification No. RDSO/PE/SPEC/EMU/0196–	Please refer modified Annexure-I, S. No. 7

		rates and arrangement of filtered air, noise level, configuration with details, details of the capacitor for DC link and resonance circuit, if provided, the permissible power loss, protection system, overall dimensions and weight, load management in case of reduced auxiliary power.	rates and arrangement of filtered air, noise level, configuration with details, details of the capacitor for DC link and resonance circuit, if provided, the permissible power loss, protection system, overall dimensions and weight, ***Capacity calculation***, load management in case of reduced auxiliary power.	2019 (Rev.0)	
17.	4.20.1 Annexure XIII	The coaches shall be equipped with an audio/visual passenger alarm system. ~~Minimum 04~~***One*** special extra large size alarm pushbuttons shall be provided ***in each compartment of the***~~per~~ Car for easy identification and access for the passengers. Each Car shall be provided with the following: • flush mounted alarm push mechanism with integrated dual LEDs to indicate the system is ok and alarm system activated anywhere in the coach , • flush mounted LED based Alarm indicator on each side of the coach and outside of the coach also,	The coaches shall be equipped with an audio/visual passenger alarm system. ~~Minimum 04~~***One*** special extra large size alarm pushbuttons shall be provided ***in each compartment of the***~~per~~ Car for easy identification and access for the passengers. Each Car shall be provided with the following: • Flush mounted alarm push mechanism with ***key reset***.~~integrated dual LEDs to indicate the system is ok and alarm system activated anywhere in the coach.~~ • ***One LED indication light individually corresponding to each of the emergency push button shall be provided for every compartment of the car. The location shall be in the corresponding cabinet***		Please refer modified Annexure-XII, Clause No. 4.20.1

			corridor area for easy identification • Flush mounted LED based Alarm indicator ***shall be provided outside the coach*** on each side. ~~of the coach and outside of the coach also~~		

ICF/Mechanical comments received vide letter dated 03.05.2024 on RDSO specification RDSO/SPEC/PE/EMU/0196/Rev. 01-2024

S. No	Clause no.	Existing Description	ICF Remarks reference.	RDS comments
1.	**1.3.5**	Weight of Train with passenger load (sitting passengers + 10 % extra @ 70 kg per passenger) without inclusion of scope of supply of equipment contained in this specification shall be 550 ton (755 ton, in case bogie is not included in scope of supply) (Purchaser's scope). For performance evaluation purpose, the configuration of 16-car rake shall be two End Basic Units and two Middle Basic Units, fully vestibuled and at gross weight, which will be equivalent to 550 ton (755 ton, in case bogie is not included in scope of supply) and weight of supplied equipment under scope of supply of this specification (all items mentioned in clause **Error! Reference source not found.** to be considered). Each basic unit shall consist of four Cars i.e. two motorized Car (MC) and two trailer Cars (TC).	Weight of Train with passenger load (sitting passengers + 10 % extra @ 70 kg per passenger) without inclusion of scope of supply of equipment contained in this specification shall be **607** ton (**802 ton**, in case bogie is not included in scope of supply) (Purchaser's s.cope). For performance evaluation purpose, the configuration of 16-car rake shall be two End Basic Units and two Middle Basic Units, fully vestibuled and at gross weight, which will be equivalent to ~~550~~ ***607 ton***(~~755~~ ***802 ton*** in case bogie is not included in scope of supply) and weight of supplied equipment under scope of supply of this specification (all items mentioned in clause 4.1 to be considered). Each basic unit shall consist of four Cars i.e. two motorized Car (MC) and two trailer Cars (TC). Explanation - The weights suggested are based on the weights arrived after manufacturing of Vande Bharat Chair Car. The Weights of Bogies (without callipers, without brake disc, brake pads etc. without Traction Motors and transmission) -**195 T** Payload (Normal) - 87 T Payload (Overload)- 8.26 T	Please refer modified clause No. 1.3.5, 1.4.5 & 2.6.2

			Total Payload- 95 T Other items (Carbody, Furnishing, Brakes, Doors, Water, Water tanks, Bio retention tanks , Bacteria etc.) -512 Total - 195+95+512 = 802 T (with bogies) Without bogies -95+512= 607 T	
2.	1.4.5	The equipment design shall incorporate all essential features necessary to yield high traffic use, low maintenance requirements, easy maintainability, high regeneration, high efficiency, light in weight, user & environment friendly and high reliability in train operation. The design shall also facilitate easy erection, inspection, maintenance and replacement of the sub-units/ assemblies of all the equipment. The total weight of the items under scope of supply of this specification (all items mentioned in clause 4.1 to be considered) shall not exceed 390 ton (185 ton, in case bogie is not included in scope of supply).	The equipment design shall incorporate all essential features necessary to yield high traffic use, low maintenance requirements, easy maintainability, high regeneration, high efficiency, light in weight, user & environment friendly and high reliability in train operation. The design shall also facilitate easy erection, inspection, maintenance and replacement of the sub-units/ assemblies of all the equipment. The total weight of the items under scope of supply of this specification (all items mentioned in clause 4.1 to be considered) .shall not exceed ***370 ton*** (***175 ton***, in case bogie is not included in scope of supply). As per the details with ICF, the weights of various propulsion system suppliers are - 165T to 171 T. Total Gross Weight with this will be 370+607=977 T. With 185T, the weight will be 987T. RDSO is requested to consider.	Please refer modified clause No. 1.3.5, 1.4.5 & 2.6.2
3.	2.6.2	The guaranteed performance shall be available from 22.5 kV to 30 kV for gross train weight of 550 ton (755 ton, in case bogie is not included in scope of supply) plus weight of equipment covered under this specification to be supplied by Supplier. The maximum current drawn by a 16-car loaded Train to meet the performance requirements of this specification at 22.5 kV shall not exceed 600 Amp. Regenerative braking system shall continue to operate when the supply voltage is in the range from 17kV to 30kV. Train operation shall be feasible at OHE voltage of 17 kV, may be with	The guaranteed performance shall be available from 22.5 kV to 30 kV for gross train weight of ~~550 ton (755 ton, in case bogie is not included in cope of supply)~~ ***as per clause 1.3.5*** plus weight of equipment covered under this specification to be supplied by Supplier. The maximum current drawn by a 16-car loaded Train to meet the performance requirements of this specification at 22.5 kV shall not exceed 600 Amp. Regenerative braking system shall continue to operate when the supply voltage is in the range from 17kV to 30kV. Train operation shall be feasible at OHE voltage of 17 kV, may be with restricted power, however, the reduction in power below 22.5 kV should be proportional to reduction in voltage. It should be possible to run the Train up to 24-car formation with suitable parametric changes to take care of OHE	Please refer modified clause No. 2.6.2

		restricted power, however, the reduction in power below 22.5 kV should be proportional to reduction in voltage. It should be possible to run the Train up to 24-car formation with suitable parametric changes to take care of OHE limitations.	limitations.	
4.	3.1.1 (i)	The capacity of the traction motor and the other equipment shall be adequate to permit continuous operation of 16-car train comprising 4 basic units of total weight 550 ton (755 ton, in case bogie is not included in scope of supply) and items covered under scope of supply of this specification (all items mentioned in clause 4.1 to be considered) to be supplied by Supplier so as to meet the performance requirements specified herein. The design shall permit the operation of Train up to 24 cars under loaded conditions with the unit weight as above with suitable parametric changes to take care of OHE limitations. All performance calculations/ evaluations shall be with respect to 16-Car train having four basic units unless stated otherwise.	The capacity of the traction motor and the other equipment shall be adequate to permit continuous operation of 16-car train comprising 4 basic units of total weight ~~550 ton (755 ton, in case bogie is not included in scope of supply)~~ ***as per clause 1.3.5*** and items covered under scope of supply of this specification (all items mentioned in clause 4.1 to be considered) to be supplied by Supplier so as to meet the performance requirements specified herein. The design shall permit the operation of Train up to 24 cars under loaded conditions with the unit weight as above with suitable parametric changes to take care of OHE limitations. All performance calculations/ evaluations shall be with respect to 16-Car train having four basic units unless stated otherwise.	Please refer modified clause no. 3.1.1 (i)
5.	3.2.1	The Traction performance shall be achieved for maximum gross weight of 550 (755 ton, in case bogie is not included in scope of supply) ton plus weight of items in the scope of this specification (all items mentioned in clause 4.1 to be considered) to be supplied by Supplier for 16-car train.	The Traction performance shall be achieved for maximum gross weight of ~~550 (755 ton, in case bogie is not included in scope of supply)~~ ***As per clause 1.3.5 & 2.6.2*** ton plus weight of items in the scope of this specification (all items mentioned in clause 4.1 to be considered) to be supplied by Supplier for 16-car train.	Please refer modified clause no. 3.2.1

6.	3.10	**Minimum Clearance from Rail Level** No part of the train, except the wheels, shall be within 91 mm of Rail level when the wheels are at minimum permissible diameter and the cars are loaded	***Under fully worn wheels and fully loaded condition of the coach, the minimum clearance of bogie mounted equipment from rail level shall be more than prescribed in (IRSOD 2022) under worst conditions. The minimum clearance for the body mounted underslung equipment shall be 215 mm under tare condition with fully worn wheels*** ***Explanation : The Modified clause doesn't take care of other like Air spring Uncompensated wheel wear etc.***	Please refer modified clause no. 3.10
7.	4.8.13 (iii)		***Suggestion : It is requested to consider Ethernet as standard communication)***	No change in the specification is envisaged. Please also refer modified clause no. 4.8.13 (iii)
8.	Annexure II (a) 1	**Conditions:-** i) 16 car loaded rake ii) Line Voltage 22.5 kV AC ii) All out run (with dwell time of 30 sec) iii) Maximum possible regeneration with full service brake iv) Gross weight of Train : 550t (755 ton, in case bogie is not included in scope of supply) plus weight of the equipment (all items mentioned in clause no. 4.1 to be considered) to be supplied by Supplier for 16 Car Train	**Conditions:-** i) 16 car loaded rake ii) Line Voltage 22.5 kV AC ***iii)*** All out run (with dwell time of 30 sec) ***iv)*** Maximum possible regeneration with full service brake ***v)*** Gross weight of Train : ~~550t (755 ton, in case bogie is not included in scope of supply) plus weight of the equipment (all items mentioned in clause no. 4.1 to be considered) to be supplied by Supplier for 16 Car Train~~ ***As per clause No. 1.3.5 & 2.6.2***	Please refer modified Annexure II
9.	Annexure II (b) 1	**REF. CLAUSE 3.5.3 and Chapter 3** **1. Conditions:-** i) 16 car loaded rake ii) Line Voltage 22.5 kV AC iii) All out run (with dwell time of 30 sec) Maximum possible regeneration with full service brake iv) Gross weight of Train: 550t (755 ton, in case bogie is not included in scope	**REF. CLAUSE 3.5.3 and Chapter 3** **Conditions:-** i) 16 car loaded rake ii) Line Voltage 22.5 kV AC ***iii)*** All out run (with dwell time of 30 sec) ***iv)*** Maximum possible regeneration with full service brake ***v)*** Gross weight of Train : ~~550t (755 ton, in case bogie is not included in scope of supply) plus weight of the equipment (all items mentioned in clause no. 4.1 to~~	Please refer modified Annexure II

<table>
<tr>
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<td>of supply) plus weight of the equipment (all items mentioned in clause no. 4.1 to be considered) to be supplied by Supplier for 16 Car Train</td>
<td>~~be considered) to be supplied by Supplier for 16 Car Train~~ ***As per clause No. 1.3.5 & 2.6.2***</td>
<td></td>
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<tr>
<td>10.</td>
<td>1.3.5 of Annexure XIII</td>
<td>~~Weight of Train with passenger load (sitting passengers + 10 % extra @ 70 kg per passenger) without inclusion of scope of supply of equipment contained in this specification shall be 550 ton (755 ton, in case bogie is not included in scope of supply) (Purchaser's scope). For performance evaluation purpose, the configuration of 16-car rake shall be two End Basic Units and two Middle Basic Units, fully vestibuled and at gross weight, which will be equivalent to 550 ton (755 ton, in case bogie is not included in scope of supply) and weight of supplied equipment under scope of supply of this specification (all items mentioned in clause 4.1 to be considered). Each basic unit shall consist of four Cars i.e. two motorized Car (MC) and two trailer Cars (TC).~~

Weight of 24-car Train with passenger load @ 80 kg per passenger (including 10 kg for luggage) without inclusion of scope of supply of equipment contained in this specification shall be:
a. = Gross weight -278 -307 (please refer Note-1) ton (in case bogie is included in scope of supply) (Purchaser's scope) OR
b. = Gross weight -278 (please refer Note-1) ton, (in case bogie is not</td>
<td>Each basic unit shall consist of four Cars i.e. two motorized Car (MC) and two trailer Cars (TC).

The Approximate weights of the Coaches without propulsion system weights is to be obtained from Manufacturing units in the following format:

<table>
<tr><th>Coach Type</th><th>Tare weight (in tonnes) without propulsion items mentioned in clause 4.1</th><th>Normal Payload (in tonnes, considering weight of each passenger as 80 kg)</th><th>Overload (in tonnes, considering weight of each passenger as 80 kg)</th></tr>
<tr><td></td><td></td><td></td><td></td></tr>
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<td>Please refer modified clause No. 1.3.5, 1.4.5 & 2.6.2</td>
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<td><u>included in scope of supply) (Purchaser’s scope).</u>

<u>Each basic unit shall consist of four Cars i.e. two motorized Car (MC) and two trailer Cars (TC).</u></td>
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<td>11.</td>
<td>2.2.1 of Annexure XIII</td>
<td>~~The capacity in different types of Cars of Train is indicated in the table below:~~

<table>
<tr><td>~~Type of Car~~</td><td>~~Type of arrangement~~</td><td>~~Passenger Capacity~~</td></tr>
<tr><td>~~AC

(Seating type)~~</td><td>~~Driving Car with Luggage, Staff Compartment (AC Chair Chair) & Passenger area (AC Chair Car)~~</td><td>~~40 for passenger & 4 for Train staff~~</td></tr>
<tr><td></td><td>~~AC Chair Car~~</td><td>~~78~~</td></tr>
<tr><td></td><td>~~Executive AC Chair Car~~</td><td>~~52~~</td></tr>
</table>

• ~~* In Trailer cars with pantographs passenger capacity may reduce by 4 to 6 numbers.~~

<u>The passenger capacity in different types of Vande Bharat Sleeper Cars of Train</u></td>
<td>~~The capacity in different types of Cars of Train is indicated in the table below:~~

<table>
<tr><td>~~Type of Car~~</td><td>~~Type of arrangement~~</td><td>~~Passenger Capacity~~</td></tr>
<tr><td>~~AC

(Seating type)~~</td><td>~~Driving Car with Luggage, Staff Compartment (AC Chair Chair) & Passenger area (AC Chair Car)~~</td><td>~~40 for passenger & 4 for Train staff~~</td></tr>
<tr><td></td><td>~~AC Chair Car~~</td><td>~~78~~</td></tr>
<tr><td></td><td>~~Executive AC Chair Car~~</td><td>~~52~~</td></tr>
</table>

• ~~* In Trailer cars with pantographs passenger capacity may reduce by 4 to 6 numbers.~~

<u>The passenger capacity in different types of Vande Bharat Sleeper Cars of Train Set to be provided by PUs.</u></td>
<td>Coach layout drawings to be provided by ICF/PUs.</td>
</tr>
</table>

		Set to be provided by PUs.	***The tentative Layouts of Vande Bharat Sleeper trains with passenger capacity details are attached as enclosure to ICF Annexure-1 to RDSO Spec RDSO/PE/SPEC/EMU/0196-2024(Rev-1). The Layouts are tentative tor the purpose of Guidance. Layouts may undergo change during detailed design Phase.***	
12.	Clause 2.2.2	Weight of 70 kg (including 10 kg for luggage) has been considered per passenger for arriving at gross weight of Train.	The Weight of Passenger including 1.0 kg luggage tor Sleeper Car can be considered as 80 Kg inline with standard practice followed tor Sleeper coaches and also as followed in WTA -527.	Please refer modified Annexure-XII, clause no. 2.2.2

M/s ABB comments:

S. No	Clause no.	Clause Description	M/s. ABB comments	RDSO comments
1.	4.3.3	The transformer will conform to IEC 60310 and temperature rise limits of the windings and oil shall correspond to IEC 60310 minus 20° C under all conditions of operations. Winding conductor of transformer shall be provided with 'H' class enamel and nomex paper insulation/aramid paper insulation of class 'H'.	"Vide clause 4.3.3, Nomex (highlighted as above) is specifically mentioned which is favoring a specific vendor/make/supplier leading to price dominance. We suggest it to be changed to "Aramid Insulation" and not restrict the same to specific supplier so that Industry can get price realization / competitive solution. Please note Nomex, per-se, is a specific trademark make of "Aramid Insulation" manufactured by Dupont. Therefore, request to kindly replace 'Nomex' with 'Aramid Insulation'. as mentioning 'Aramid Insulation' will serve the purpose to use 'Nomex' as well as open the market for other Insulation suppliers, as well as, enabling the competitive pricing from Dupont.	Aramid paper insulation has already been mentioned in the clause. Hence no change in the specification is envisaged.

Note:

1. Carriage Directorate vide notes dated 15.05.24, 18.05.25, 30.04.24, 03.05.24 & 17.05.24 has advised the comments on draft specification. Accordingly, clause no. 1.4.1, 2.1.2, 2.2.1, 2.2.2, 2.4.2, 2.9.2, 2.14, 3.10, 4.7.45, 4.8.16, 4.20.1, 4.20.4, 5.2.2 (vii) has been modified.

2. Director/Pneumatic note dated 08.05.24, Director/EEM note dated 03.05.24, Director/Track-II note dated 02.05.24 & 06.05.24, TI Directorate note dated 24.06.24 has advised the comments on draft specification. Accordingly, clause No. 2.4.1, 4.16.1 (i), 4.42.4, 4.42.6 have been modified.