General Bid Bulletin No. 11
09 June 2021

IFB No. 21-031-4

THE MALOLOS-CLARK RAILWAY PROJECT AND THE NORTH SOUTH RAILWAY PROJECT-SOUTH LINE (COMMUTER) PACKAGE CP NS-03: ROLLING STOCK-LIMITED EXPRESS TRAINSETS

This General Bid Bulletin is issued to amend/clarify certain provisions in the Bidding Documents for the abovementioned project. Please refer to the attached Annexes of this General Bid Bulletin duly approved by the end-user and co-implementer for details:

1. **Annex "A"** –Answers to Queries from Prospective Bidders including clarifications to the Bidding Documents;

2. **Annex "B"**– Revisions to the Bidding Documents; and

3. **Annex "B – 1"** – Revised pages/amendments and final form as revised/amended.

All other portions of the Bidding Documents affected by these revisions, amendments and/or clarifications shall be made to conform to the same.

Revisions/amendments/clarifications made herein shall be considered an integral part of the Bidding Documents for this project.

For your information and guidance.

For the Bids and Awards Committee IV:

SIGNATURE REDACTED

JOSEPH CONRAD D. DUEÑAS
Chairperson

Annex A

PACKAGE CP NS-03: ROLLING STOCK - LIMITED EXPRESS TRAINSETS
General Bid Bulletin No. 11
Annex A

Item No.	Volume Section No. Page No. Clause No. / Title Reference Text	Clarification Request	Proposed Revised Text (if any)	Response
1.	INVITATION FOR BIDS (IFB) Section VIII. General Conditions Part 3 – Conditions of Contract and Contract Forms Section VIII – Particular Conditions IFB-2, GC-57, GC-62, PC-14 14.2 Advance payment; 14.9 Payment of Retention Money;4.2 Performance Security	In order to save the cost of issuing required bonds, we would like to issue Bid security, Advance payment security, Performance security and Retention security from Japanese bank(s) being "advised" by a reputable bank or financial institution located and authorized to do business in the Republic of the Philippines	-NA-	The bidder's understanding is correct. The bidder shall abide to the requirement stipulated in the Part 1 Bidding Procedures and Part 3 Conditions of Contract and Contract Forms.

2.	Part 1 - Bidding Procedures Section IV – Bidding Forms BF 36 37 Schedule 1.1: General Items	For executing the Work in accordance with the Contract, the Contractor will build up and maintain appropriate project management organization till completion of the whole of the Works. This would be the burden to the Contract in terms of cash flow and it would increase the cost of Contract Price. In order for us to make our bidding price very competitive, please allow us to add one new column for “Project Management Cost” in Schedule 1.1 General Items when we submit our bid. This “Project Management Cost” will cover the minimum cost of the Contractor’s project management organization which is incurred through entire project period. The payment of such “Project Management Cost” shall be paid in proportion during the Contract Period.	Milestone No. 114 Project Management Cost (Payment for Milestone 114 will be paid in proportion to the overall duration) Milestone No. 115 Other obligations with regard to General Items, that are considered necessary to comply with the Contract but which are not covered in other Schedules and the above milestone items. Note: The Bidder may sub-divide the above Milestones and/or add appropriate proposed Milestones.	The bidder’s request is rejected.

3.	Volume II of III Part 2 Employer's Requirement GBB3, GBB8 Appendix B: Split Responsibility on Rolling Stock and Other Works Annex B. Attachment 1 Annex A 1.1.3, Table B2 Item 7	Split Responsibility in Special Tools for rolling Stock and Depot Equipment According to GBB3, Annex B – Attachment 1, section 1.1.3, the Table B2 corresponding to the Split Responsibility in Special Tools for Rolling Stock and Depot Equipment has been deleted. After analysing response given in Item 7 of GBB8, we want to insist on clarifying the following: Bidder understands that the Depot Equipment is NOT part of the scope of the CP NS-03 Rolling Stock – Limited Express Trainsets Project. For Depot Equipment means which the Bidder understand at least the following equipment: - Turn Table for bogies; - Lifting jacks for carbody; - Wheel reprofiling machine; - Wheel lathe; - Bogie press; - Wheelset press; - Horizontal/vertical lathes; Please confirm that the Bidder understanding is correct and that all	N/A	Bidder understanding is correct. Bidder mentioned depot equipment is not part of the scope of the CP NS-03 Rolling Stock – Limited Express Trainsets Project.

		these depot equipments are not part of the scope of the CP NS-03 Rolling Stock – Limited Express Trainsets Project.		
4.	Volume II of III Part 2 Employer's Requirement ERT-151 24.8.1	Main Special Tools and Diagnostic Test Equipment. This section defines the minimum Special Tools and Test Equipment to be supplied by the Contractor. However, there are some items which are conceived for the testing and diagnosis of some specific equipment that are not part of the scope of the CP NS-03 Rolling Stock – Limited Express Trainsets Project, such as the radio or the signalling equipment. Therefore, the Bidder understands that the special tools of such Equipment which is not part of the CP NS-03 Contractor's delivery, will not have to be supplied by the CP NS-03 Contractor. Please confirm if the Bidder's understanding is correct.	N/A	Bidder understanding is correct.
5.	GBB8 Annex A Item 73	Further clarification is kindly requested regarding GBB8 Item 73: For a fleet size of 7 trainsets, having 2 skilled and available teams (1 for each	-NA-	Bidder proposal is rejected. The primary delivery location for the Limited Express Trainsets is the Mabalacat Depot. However, the

		depot) to perform warranty service during Defects Notification Period will not be cost efficient. Therefore, Bidder proposes service during DNP to be done at a unique depot. Please confirm if this proposal is possible.		Employer shall reserve the right to change the delivery location during the project implementation.
6.	Volume III Particular Conditions - Part B (Specific Provisions) PC-14 4.2 Performance Security	"After the expiry of the Defect Notification for each Section for which the Taking-Over Certificate has been issued (for the definition of 'Section' refer to Contract Data, Sub-Clause 14.9), the value of the Performance Security will be reduced by the relevant percentage shown below;" At KD6 "Delivery Trainsets 1-7" Performance Security will be reduced by 90% and at KD8 "Completion of Trial Operation support and the whole of the Works", Performance Security will be reduced completely. In our understanding there is a discrepancy between the fact that the Performance Security is reduced to 0 at KD8 and the above description "After the expiry of the Defect Notification for each Section for which the Taking-Over	-NA-	Please see annex B for the updated section in 4.2 Performance Security.

		Certificate has been issued" since KD8 is an earlier moment in time than expiry of the Defect Notification of each Section. Please clarify how Performance Security is reduced. Furthermore, in case the Performance Security is totally reduced at KD8, for the avoidance of doubt we kindly request to delete references in 4.2 of the General Conditions such as "The Employer shall return the Performance Security to the Contractor within 21 days after receiving a copy of the Performance Certificate".		
7.	Volume II of III SECTION VI, Employer's Requirements ERG-17 4.5.2.1	1) In addition, the Contractor shall provide 15 sets of PPEs to the Engineer and Employer; The Bidder understands that the 15 sets of PPEs which the Contractor shall provide are the grand total for the Engineer and Employer, but not 15 sets each to the Engineer and Employer. Please confirm the foregoing understanding is correct.	1) In addition, the Contractor shall provide total 15 sets of PPEs to the Engineer and Employer's use;	Bidder understanding is not correct. The number of PPEs shall be 15 sets each for the Engineer and Employer. Please refer to Annex B.

8.	Volume II Section VI ERT-2 1.2.3 ERT-34 2.8.1.8 ERT-35 2.8.1.9 Compatibility with MCRP, NSCR and NSRP-S General Bid Bulletin No. 8	It is impossible for the Bidder to estimate associated costs appropriately and prepare the Technical Proposal in complying with the requirement without detailed essential information for the equipment arrangement of the driver ' s cab , interior, roof , underfloor with outline of each equipment including constraints such as cooling space, wire separation, mounting direction and air piping arrangement including test valves, valves and cocks etc. as well as the detailed information for 1) through 5) under ERT 1.2.3. Therefore, the Bidder humbly requests the Employer to provide the related information of MRCP, NSCR and NSRP-S so that the Bidder can evaluate the related cost without any contingencies.	N/A	The employer is unable to provide the requested information due to their availability. The requirement is meant to be demonstrated by the Contractor during the design phase by satisfying of design interface requirement particularly on equipment arrangement.
9.	Volume II Section VI ERT-7 1.6.2.1 13 ERT-60 7.1.4 Doors and Door Control	In accordance with General Bid Bulletin No.8 dated 19 May 202 I, the single leaf plug-in sliding Doors has been accepted by the Employer. 13. Passenger Doors Bi-parting of single leaf plug - in	1.6.2. l 13 Passenger Doors Bi-parting or ~~of~~ single leaf plug - in sliding Doors, or single leaf pocket sliding Doors.	Bidder request is rejected. The employer deemed understand that the pocket door is not capable for a push back function as requested in clause 7.3.11.

	General Bid Bulletin No.8 Annex B 1.6.2.1 1 3 7.1.4 Types of door	sliding Doors The doors shall be bi-parting or single leaf plug-in sliding doors, ... In addition to this revision, the Bidder humbly requests the Employer to add "single leaf pocket sliding Doors" as one of the options because the " single leaf pocket sliding Doors " is the ser vice-proven design in Japan , has been being applied on multiple high speed trains and limited express trains, and brings equivalent level of safety and reliability. Therefore, please consider revising the sentences as provided.	7.1.4 The doors shall be bi-parting or single leaf plug-in sliding door or single leaf pocket sliding Doors	
10.	Volume II Section VI ERT-8 1.7 Track Standards	Main Line : EN 60 E1 Standard Length 25m Depot : JIS 50N Standard Length 25m It is noted that different track standards are specified for the main line and the depot. The Bidder humbly requests the Employer to clarify why the track standards are different between the Main Line and the Depot.	N/A	The differences are based on speed, weight. Mainline are highspeed sections that shall use bigger rail while depot is a low speed sections and can use smaller rail.

11.	Volume II Section VI ERT-8 1.8.1 Straight tracklength between curves	The Bidder assumes that the straight track length between curves including switch machines is more than 20m (one car length) regardless of radius of curvature. Please confirm the foregoing understanding is correct. Since the said condition is essential to consider the bias between two cars, if the Bidder's understanding is not correct, please provide the information of the minimum straight track length.	N/A	Minimum straight length of the main line is at least 20 meters. In DEPOT, the minimum straight-line length between curves is applied to 5m.
12.	Volume II Section VI ERT-20 1.16.4.3 Ground Cable	Minimum grounding cable size shall be 6 mm2, unless otherwise reviewed by the Engineer, and the size shall be equal to, or larger than, that of the largest power wire connected to that equipment. All grounding wires and cables shall utilize longitudinally striped green and yellow insulation, or heat shrinkable tubing applied over the conductor insulation. I) In case that the grounding cable size shall be larger than that of the largest power wire, the Bidder is concerned about the thickness of wiring diameter for the equipment consuming the high current., which results in complexity of wiring routing and weight increase. Also, it is excessive to apply 6 mm2 g rounding cable	~~Minimum grounding cable size shall be 6 mm2, unless otherwise reviewed by the Engineer, and the size shall be equal to, or larger than, that of the largest power wire connected to that equipment~~. The grounding cable connected to each equipment shall be adequate size, which shall be proposed by the Contractor and reviewed by the Engineer during Design Review. All grounding wires and cables shall utilize the ring mark in green at either end	Bidder request is rejected. The Installation and Maintenance Requirements of Electric Works – Grounding is a MCRP, NSCR and NSRP-S project wide type of requirement.

		size for conduit grounding wire and small current equipment. Therefore, the Bidder humbly requests the Employer to revise the sentences as provided. 2) The Bidder assume s that the grounding wires and cab les with the longitudinally striped green and yellow are excessive, and the marker with identification number is sufficient to identify the grounding wires and cables. Therefore, please consider revising the sentence as provided.	of grounding wires and cables ~~longitudinally striped green and yellow insulation, or heat shrinkable tubing applied over the conductor insulation.~~	
13.	Volume II Section VI ERT-20 1.16.5.1 Cable connectors	All cable connectors used in exterior locations shall be rated IP65 using quick connect/disconnect couplings, with positive locking and visual indication of mating. These shall be subject to review ed by the Engineer. Please clarify the purpose of " visual indication of mating". The Bidder has never experienced to use quick connect/disconnect couplings with " visual indication of mating" in any previous projects and therefore, the Bidder humbly request the Employer to delete this pro vision.	~~All cable connectors used in exterior locations shall be rated IP65 using quick Connect disconnect couplings, with positive locking and visual indication of mating.~~ ~~These shall be subject to reviewed by the engineer~~.	Bidder request is rejected. There is a blind mate electrical connector in the market, which is not preferred by the Employer.

14.	Volume II Section VI ERT-20 1.16.5.2 Terminal blocks	Terminal blocks, where used, shall be of a high quality, plated stud type wherever possible, with proper creepage and clearance provisions for the voltage used. Terminal blocks shall each be given a unique identification number, and each "point" on the block shall be numbered. The Bidder humbly requests the Employer to add "stainless stud" as one of the options because the "stainless stud " is the service- proven design, and brings equivalent level of antitrust capability. In addition, the Bidder also requests the Employer to add " WAGO type terminal block" which is the service-proven design and brings space-saving. Therefore, please consider revising the sentences as provided.	Terminal blocks or WAGO type terminal blocks, where used, shall be of a high quality, plated stud or stainless stud type wherever possible, with proper creepage and clearance provisions for the voltage used. Terminal blocks or WAGO type terminal blocks shall each be given a unique identification number, and each "point" on the block shall be numbered.	Bidder request is rejected. This is a project wide type of requirement.
15.	Volume II Section VI ERT-20 1.16.6.1 Wire Identification	All equipment wires shall be marked with a unique wire identification number by means of marker sleeves located within 50 mm of each end of each wire. The identification numbering system will correspond to the wire identification numbering system used on	All equipment wires shall be marked with a unique wire identification number by means of marker sleeves located within 50 mm of each end of each wire. In case that	Bidder request is rejected. This is a project wide type of requirement.

		the schematic drawings and wiring diagrams. In case that the wiring processing portion are within 50 mm of each end of each wire, it is unable to mark a unique wire identification number within 50mm. Thus, since the Bidder respectfully requests the Employer to accept the foregoing case as an exception and to consider revising the sentences as provided.	the wiring processing portion are within 50 mm of each end of each wire, the Contractor shall mark with a unique wire identification number as close as possible from each end of each wire. The identification numbering system will correspond to the wire identification numbering system used on the schematic drawings and wiring diagrams.	
16.	Volume II Section VI ERT -21 1.16.9.1 Wire and Cable installation	Electrical wires and cables shall be run in cleats, conduit, ducts or wire trays, as the application permits, but all shall be protected from physical damage, such as chafing, ballast impact, etc. Wires and cables feeding equipment subject to the elements shall in corporate drip loops to prevent moisture from collecting around fittings. Electrical wires and cables with a large diameter have a thick sheath, so it has a strong mechanical property. Therefore, the Bidder under stands that except electrical wires and cables run in cleats, conduit, ducts or wire trays, the	N/A	Bidder understanding is not correct. As for the bidder statement on rubber hose, please refer to clause 21.8.2 - Each equipment/ system shall be designed to minimize the risk of any fire. Materials used in the manufacture of vehicle and the equipment shall be selected to reduce the heat load, rate of heat release, propensity to ignite, rate of flame spread, smoke emission and toxicity of combustion gases.

		electrical wires and cables smaller than 14mm2 / ~~G~~7 at the exterior will be protected by rubber hose in widely adopted for other Asian project. Please confirm the Bidder 's understanding is correct.		
17.	Volume II Section VI ERT-30 1.21.9 Automatic extended platform gap filler General Bid Bulletin No. 10	The Contractor shall provide the automatic extended platform gap filler in the event of the platform gap between the car body and the platform to address person with disability access and the risk of passenger trap in between the gap. Although the Bidder received the Employer's reply as per General Bid Bulletin No. 10 dated 25 May 2021, the Bidder considers that the automatic extended platform gap filler should be integrated in PSD or platform because of the following reasons. - Service availability The automatic gap filler requires many devices, complicated mechanisms and behaviors such as actuators for automatic extension and retention, locking mechanism in fully extended and fully retracted positions, obstacle detection function to detect obstacles, people and platform, and so on. The	~~The Contractor shall provide the automatic extended platform gap filler in the event of the platform gap between the Car body and the platform to address person with disability access and the risk of passenger trap in between the gap~~	Bidder request is rejected. The Employer preliminary safety requirement of the related hazardous event requires an automatic extended platform gap filler as the mitigation measure.

		Bidder concerns that the failure of the automatic gap filler with such a complicated mechanism may bring significant interruption of ser vice operation. - Automatic gap filler operating time In addition to passenger side doo r opening and closing time specified in ERT 7.1.14, the automatic gap filler operating time, i.e., extension and retraction time is required. - Weight impact Weight of the automatic gap filler system with the above complicated mechanism is heavy and impacts the tare weight specified in ERT 1.6.1.5. - Maintainability Many maintenance activities including dissembling, inspection, cleaning, assembling and adjusting for the automatic gap filler are required. Also, spare parts, consumable parts and special tools are required for this system. In consideration with the above, the Bidder considers the best solution is to equip the automatic gap filler on PSD or platform in limited station where limited express trains		

		stop. Therefore, the Bidder sincerely requests the Employer to reconsider to exclude this requirement from the scope of work of CP NS-03: Rolling Stock.		
18.	Volume II Section VI ERT-30 2.1.4 Anti-climber	The car body design shall incorporate a function of anti-climbing on both ends of all cars to prevent one car from climbing over another in the event of a collision. The Bidder would like to confirm the interface information about anti-climber. In the Bidder's understanding, the limited express trains in this project and the commuter trains will be operated on the same line alternately. Then, the anti-climber interface shall be compatible with the commuter trains MCRP, NSCR and NSRP -S which will be operated on the same line. The Bidder humbly requests the Employer to provide detailed design information including, but not limit ed to, the dimensional information of anti-climber of MCRP, NSCR and NSRP-S as the essential interface information which is crucial in preparation of the bid proposal. If the commuter trains for MCRP, NSCR and NSRP-S do not have anti-climber,	N/A	The employer is unable to provide the requested information due to its availability. The requirement is meant to be demonstrated by the Contractor during the design phase by satisfying the design interface requirement particularly on equipment arrangement.

		the Bidder wishes to delete this requirement.		
19.	Volume II Section VI ERT-33 2.4.3 Crash Worthiness General Bid Bulletin No.10	The Bidder assumes that the requirement about crashworthiness impacts overall configuration of train, thus the Bidder wishes to avoid misunderstanding of the requirements. As per the Employer's reply in the General Bid Bulletin No.10 dated 25 May 2021, the required crashworthiness condition is not limited to train and truck condition. On the other hand, as far as Bidder's understanding, the requirement in Japanese Ministerial Ordinance, MLIT, specifies only truck and train level crossing scenario. The Bidder wishes to confirm that the crashworthiness scenario based on MLIT (Japanese Ministerial Ordinance) is considered as the design basis of this project.	N/A	Bidder has mistakenly understood employer response in GBB 10. Employer has stated that the bidder is allowed to propose the crash worthiness, in accordance to the Japanese Ministerial Ordinance, MLIT. Employer response in GBB 10 was implying on **factors** in the risk assessment and was not only limited to the collision at train level crossing scenarios i.e. closed railway? open railway? etc. for the types of collision obstacles. Clause 2.4.4 was added. Please refer to Annex B.
20.	Volume II Section VI ERT-33 2.5. I Jacking and Lifting Requirements	Jacking and lifting points/pads shall be provided for normal maintenance operation, sized and positioned to accept lifting equipment. In addition to these jacking and lifting points, emergency jacking and lifting points shall also be provided at all four corners	N/A	The employer is unable to provide the requested information due to their availability. The requirement is meant to be demonstrated by the Contractor during the design phase by satisfaction

		and at the centre of each vehicle end to allow jacking/ lifting under emergency situation, including derailment. The Bidder understands that the jacking and lifting points/pads shall be arranged and designed in consideration of interface with depot facilities. Accordingly, the Bidder requests the Employer to provide the detailed information for jacking and lifting points/pads to accommodate the arrangement of jacking pad and underfloor equipment as an essential information which is crucial in preparation of the bid proposal.		of design interface requirement particularly on equipment arrangement.
21.	Volume II Section VI ERT-34, 2.8.1.6 ERT-134, 21 .2 .9 Under-frame mounted equipment	" Hard lock Nut" to mounting of the under-floor equipment which suspended directly from the underframe, which is the service-proven design in Japan and brings equivalent level of prevention of fastener loosening, complies with the requirement of ERT 2.8.1.6. The Employer's reply as per General Bid Bulletin No. 10 dated 25 May 2021 allow the Bidder to propose an alternate design during the design stage to request for omission or relaxation,	~~for equipment suspended from the underframe, the load of the equipment on each boll shall not the clamp load of the bolt. Set screws shall not be used. Where practical, load~~ ~~on the bolts shall be no greater that exerted when the bolt is tightened to its~~	Bidder request is rejected. The requirement shall be demonstrated during the project implementation.

		subject to the Engineer 's review, however, the Bidder is afraid that ERT 21.2.9 may restrain the Bidder from submitting such request during the design stage. In order for the Bidder to be sure that it can submit an alternate design proposal for the Engineer's review and approval, the Bidder humbly requests the Employer to delete the provision under clause 21.2.9.	~~recommended torque. When practical loads shall be on structural cross beams etc. Huck bolts can be used according to their strength specification.~~	
22.	Volume II Sect ion VI ERT -36 3.1.11 Wheel lubrication	Bogie wheelbase shall be between 2100mm - 2700mm. The Contractor shall include the dry stick type wheel lubricant in case of the wheelbase design is higher than 2I00mm. The Bidder understands that the wheel flange lubrication system shall be provided in accordance with ERT 3.4.12 regardless of bogie wheelbase. Therefore, the Bidder requests the Employer to allow applying the optimum flange anointing system such as oil injection type, which has many achievements, not limited to dry sticks. Accordingly, the Bidder requests the Employer to amend the requirement as proposed revised text.	Bogie wheelbase shall be between 2100 nun - 2700mm. ~~The Contractor shall include the dry stick type wheel lubricant in ease of the wheelbase design is higher than 2100mm.~~	Bidder request is rejected.
23.	Volume II Section VI	It shall be physically impossible for connections to be mismatched.	~~It shall be physically impossible~~	The requirement is regarding the bogie to carbody

	ERT-41 3.9.3 Bogie-to- Carbody Connection	The Bidder is of the opinion that it is more beneficial to the Employer to common bogie to carbody connecting parts for improving the maintainability and running cost. Accordingly, the Bidder humbly requests the Employer to clarify the meaning of a requirement in this clause "It shall be physically impossible for connections to be mismatched" or delete this clause.	~~for Connections to be mismatched.~~	connection. The bogies on a car can be replaced with spare bogie or having a swap in between cars (similar type) seamlessly. Bidder proposal is rejected.
24.	Volume II Section VI ERT-41 3.10.1 Minimum clearance between bogie-mounted and carbody- mounted equipment General Bid Bulletin No.10	Under all conditions of movement between the bogies and the carbody, including fully inflated and deflated air spring conditions, there shall basically exist a minimum clearance of 50 mm between bogie- mounted and carbody-mounted equipment. This shall include any end of the vehicle having fully inflated air springs, with the opposite end having deflated air springs. Although the Bidder received the Employer' s reply as per General Bid Bulletin No. I0 dated 25 May 2021, the Bidder assumes that the requirement " there shall basically exist a minimum clearance of 50 mm between bogie-mounted and carbody- mounted	Clearance between the bogie- mounted and carbody-mounted equipment shall be designed to prevent any interference under worst case operating condition s including single failure condition.	Bidder request is rejected. This is a project wide requirement.

		equipment under all conditions" is excessive for the reason provided below. Under the normal static condition, there will basically exist a minimum clearance of 50mm between the bogie and the carbody. However, it is not feasible to maintain a minimum clearance of 50mm even if the train faces air spring deflect ion and/or maximum rotational movement of bogie under the dynamic condition, etc. The Bidder is of the opinion that it is important prevention of interference between bogie-mounted and carbody-mounted equipment under all conditions. Accordingly, the Bidder requests the Employer to amend the requirement as proposed revised text again.		
25.	Volume II Section VI ERT -43 4.1.4	The automatic coupler shall, in conjunction with the draft-gear automatically effect mechanical, electrical and pneumatic coupling. It shall also permit separation of units either manually from the track side or remotely from the cab.	4.1.4 The automatic coupler shall, in conjunction with the draft-gear automatically effect mechanical, ~~electrical~~ and pneumatic coupling. It shall also permit separation of units either manually from the track side or remotely from the cab.	Bidder request is accepted. Please refer to annex B. However, the requested information is not available. The information shall be obtained by the Contactor during the project implementation through interface with other Contractors.

	4.1.5 4.1.6	Also, an emergency connection cable that connects this electrical connection plug shall be equipped. The Contractor shall provide the required cabinet for housing the emergency connection cable on the train As per the clause 4.1.4, 4.1.5 and 4.1.6, when the jumper cable is stored on the train, the electric circuit cannot be connected automatically, so the descriptions of clause 4.1.4 and 4.1.5/4.1.6 are inconsistent. Therefore, the Bidder requests the Employer to amend the requirement of clause 4.1.4 as proposed revised text. In addition, please provide the necessary information of MCRP, NSCR and NSRP-S as shown below to coordinate in consideration with arrangements in MCRP, NSCR and NSRP-S.		

		1) Outline drawing of Jumper cable and plug 2) Arrangement drawing of plug. 3) Manufacture name		
26.	Volume II Section VI ERT-44 4.3.1 Draft gear	Each coupler type shall utilize rubber, double acting draft gear capable of withstanding all the loads described in this ERT, and which will not transmit undue vibrations into the carbody. The Bidder requests the Employer to add " hydraulic type draft gear" as one of the options so that the Bidder can offer the optimal proposal.	Each coupler type shall utilize rubber or hydraulic, double acting draft gear capable of withstanding all the loads described in this ERT, and which will not transmit undue vibrations into the carbody.	Bidder request is rejected. Coupler and draft gear requirements are project wide requirement.
27.	Volume II Section VI ERT-45 5.1.3 Fasteners 21.10.4	Visible fasteners in the passenger saloon and the Driver's cabs shall be avoided. Fasteners must be of the tamper- resistant type, manufactured from stainless steel. Tamper-proof fixing arrangements shall be fitted where necessary. Fasteners shall not be visible or accessible to passengers as far as practicable. The Bidder assumes that the temper-	~~Visible fasteners in the passenger saloon and Driver' s cabs shall be avoided. Fasteners must be of the tamper- resistant type, manufactured from stainless steel.~~ 21.10.4 Tamper-proof fixing arrangements shall be fitted in the passenger saloon	Bidder request is rejected.

	Fasteners	resistant type fasteners are not necessary for the Driver' s cabs because the passenger cannot access to the Driver's cabs and the Drivers cabs cannot be visible from the passenger. In addition, for the passenger saloon, the Bidder follows the requirement as per the clause 21.10.4. Therefore, the Bidder requests the Employer to delete the clause 5.1.3 and revise the clause 21.10.4 as provided.	where necessary and the fasteners in the Driver's cabs can be used with normal head. Fasteners in the passenger saloon shall not be visible or accessible to passengers as far as practicable.	
28.	Volume II Section VI ERT-45 5.2.1.1 Insulation	The carbody side walls and roof shall be insulated with a suitable grade of Fiberglass insulation, which shall have been treated to resist fungus and mildew. The fiberglass insulation shall be installed so as to prevent shakedown in service and where accessible shall be suitably protected/covered. All insulation shall be fire resistant. Samples shall be tested as per DIN 5510- 2.	5.2.1.1 The carbody side walls and roof shall be insulated with a suitable grade of fiberglass insulation, which shall have been treated to resist fungus and mildew. The fiberglass insulation shall be installed so as to prevent shakedown in service and where accessible shall be suitably protected/covered. All insulation shall be fire resistant. Samples shall be tested as per the clause 21.8 ~~DIN 55102.~~	Bidder request is rejected. These clauses were updated. Please refer to GBB 8 Annex B dated 19 May 2021.

	5.2.2.2 Insulation	All insulation shall be fire resistant. Samples shall be tested as per DIN 5510-2. The Bidder will comply with the fire safety requirement stipulated in ERT 21.8. Accordingly, the Bidder requests the Employer to amend the requirement as proposed revised text.	5.2.2.2 All insulation shall be fire resistant. Samples shall be teste d as per the clause 21.8-~~DIN-5501-2~~	
29.	Volume II Section VI ERT-48 5.7.5	The electrical sockets (220V 60Hz) I USB po1is shall be provided adequate position on the seats one socket per person. The sockets shall be protected by a low am p breaker. As there are three (3) designs of socket sed in the Philippines, types A, B and C the most popular type shall be provided. The Bidder assumes that either electrical socket (220V 60 Hz) or USB per person shall be provided on the seats. Please confirm the foregoing understanding is correct.	N/A	Bidder understanding is correct. Please refer to employer response in GBB 8 dated 19 May – Annex A item 18 and GBB No. 2 dated 31 Mar 2021.

30.	Volume II Section VI ERT-48 5.7.6 Passenger Seats	The seat design shall be ergonomically designed for passenger comfort, aesthetically pleasing, and eliminated gaps that will trap dirt or liquids The Bidder is of the opinion that it is impractical to eliminate the gap for the seats with reclining function. Accordingly, the Bidder requests the Employer to amend the requirement as proposed revised text.	The seat design shall be ergonomically designed for passenger comfort, aesthetically and pleasing, ~~and eliminated gaps that will trap~~ that are able to clean dirt or liquids.	Bidder request is rejected.
31.	Volume II Section VI ERT-49 5.10.4 Security locks for baggage	Security locks for baggage like dial combination locks shall be installed at bag gage s paces. The Bidder requests the Employer to delete the requirement in this clause, because the security lock may cause trouble for passenger upon boarding and alighting due to unexpected failure, malfunction etc.	~~Security locks for baggage like dial combination locks shall be installed at baggage spaces.~~	Bidder request is rejected.
32.	Volume II Section VI ERT-50 5.12.2 Windscreens	Windscreens shall have sufficient strength to resist penetration as per the requirements of UIC 651 or equivalent standard. The Bidder requests the Employer to allow Japanese regulations/standards such as JIS B 3205 or JIS B 3206 because these are the equivalent with	Windscreens shall have sufficient strength to resist penetration as per the requirements of UIC 651, JIS B 3205, JIS B 3206 or equivalent standard.	Bidder request is rejected. Clause 5.12.2 has covered the equivalent standard mentioned by the bidder.

		UIC 651. Please revise the requirements as proposed revised text accordingly.		
33.	Volume II Section VI ERT-57 6.3.2 Automatic illumination adjustment of LED lights	The Contractor shall provide LED lighting in the passenger area that is modem and aesthetically pleasing with a mass production of over 5 years' service proven. LED lighting shall be energy efficient and shall be designed to provide good quality lighting along with offering both variable and automatic illumination adjustment. The Bidder requests the Employer to amend the sentence as provided because variable and adjustable LED light costs higher than no function of variable LED light and that brings maintenance cost higher.	LED lighting shall be energy efficient and shall be designed to provide good quality lighting ~~along with offering both variable and automatic illumination adjustment.~~	Bidder request is rejected.
34.	Volume II Section VI ERT-58 6.3.3 Power supply for saloon lights	The minimum declared life s hall be 50,000 hours. The lighting shall be powered by 220V AC supply. The Bidder requests the Employer to allow I00V DC power supply for all saloon lights. According to ERT 6.4.2 and 6.4.3, the emergency lighting is required to provide 60[min] continuous lighting even if APSE failed. In order to comply with this requirement, the	The minimum declared life shall be 50,000 hours. The lighting shall be powered by ~~220V AC~~ 100V DC supply.	Bidder request is rejected. However, please refer to Annex B for the updated requirement.

		emergency lighting will be connected to battery powered I00V DC line. Even if the normal lighting is driven by I00 VDC power supply, it is configured as a separate circuit from the emergency light s connected to the 100 VDC battery power supply. That is, normal lighting and emergency lighting consist of two independent 100 V DC circuits. By standardizing normal lights and emergency lights for saloon lighting equipment, it will contribute to the reduction of running costs. Accordingly, the Bidder requests the Employer to amend the requirement as proposed revised text.		
35.	Volume II Section VI ERT-61 7.1.12 7.1.13 7.1.14 7.1.15 Passenger Side Entrance Doors	The Bidder would like to clarify the applicable scope of as following requirements, ERT 7.1.12 ERT 7.1.13 ERT 7.1.14 ERT 7.1.15 The Bidder understands that these requirements are applicable for passenger side door only. Please confirm the Bidder' s understanding is correct.	N/A	Bidder understanding is correct.

36.	Volume II Section VI ERT-61 7.1.14 Door Opening/Closing time	The Bidder would like to clarify the required opening/closing time of passenger side entrance doors. Open: 2.0 to 2.5[sec] Close: 2.5 to 3.0[sec] Since the Bidder assumes that it is quite short time to apply for limited ex press train through the Bidder' s experiences. Therefore, the Bidder humbly requests to revise the sentence as proposed revised text.	Doors shall fully open within ~~2.0 to 2.5~~ 3.0s of the door open command shall fully close within ~~2.5 to 3.0~~ 3.0 s of the door close command.	Bidder request is rejected. This requirement shall be satisfied together with the PSD interface requirement which to be identified by the Contractor during the project implementation.
37.	Volume II Section VI ERT-62 7.3.2 Shock and vibration requirement for passenger door	The door system shall be designed to with stand the effects of vibrations and shocks as defined for equipment attachments in EN12663 or equivalent standard. The Bidder assumes that IEC61373 should be applied to specify the strength requirement of door system installation instead of EN12663. Please confirm the foregoing understanding is correct.	N/A	Bidder request is noted. Please refer to Annex B.
38.	Volume II Section VI ERT-67 8.1.7	Diffuser shall be incorporated individually to window seats. The Bidder noted the Employer 's	Diffuser shall be arranged consideration with ~~incorporated individually to~~	Bidder request is noted. Please refer to Annex B.

	Air diffusers	response in General Bid Bulletin No. 10 Item No. 19 dated 25 May 2021. However, from view of maintenance, the extended branch air conditioning ducting for window side air flow will not be accessible in the situation of cleaning. And it is impossible to make access point for cleaning, thus the Bidder would like to request re-consideration about the amendment on this clause.	window seats side distribution.	
39.	Volume II Section VI ERT-68 8.3.7 Evaporator unit	The evaporator unit shall include all required components, such as the liquid line solenoid valve, modulating solenoid valve, thermal expansion valves, liquid line strainer, liquid line sight glass / moisture indicator, etc. Appropriate gauge ports for troubleshooting shall be provided. For the trouble shooting of air conditioning system, the Bidder noted that the moisture and liquid flow sight glass will help condition check. Access to the sight glass and moisture gauge in evaporator unit requires significant efforts because the location is roof top. Thus, the Bidder would like to ask the Employer whether the pressure gauge of refrigerant liquid which send	N/A	Typical TMS information on air conditioning is the air conditioning health status and the cab temperature monitor. The refrigerant pressure information normally be obtained at the VAC unit for in-situ maintenance. Employer do not see the benefit for the refrigerant pressure information in the TMS either for the driver or the maintenance personnel unless the contractor has shown the relevant design assessment during design phase.

		information to TMS monitor in cab is acceptable as alternative equipment of sight glass and moisture gauge.		
40.	Volume II Section VI ERT-78 10.3.6 Air reservoirs	Separate systems within the pneumatic system shall be supplied via a vented cut-out valve and a strainer, and shall be provided with separate air reservoirs, supplied through a check valve to protect against sudden loss of air pressure. The air brake reservoir shall be sized to provide at least three emergency brake operations under W2 loading conditions. Reservoirs shall be set to assist moisture collection and shall include automatic/manual drain valves. Since there is very limited space under the car, it is not practical to provide dedicated air reservoirs for all systems individually, such as a horn or pantograph. Such individual systems within the pneumatic system will be supplied air from a reservoir with appropriate capacity via a vented cutout valve and strainer via a branch pipe. Accordingly, the Bidder request the Employer to revise the requirement as proposed revised text.	Separate systems with in the pneumatic system shall be supplied via a vented cut-out valve ~~and a strainer, and shall be provided with air reservoirs~~, supplied through a check valve to protect against sudden loss of air pressure. The air brake reservoir shall be size d to provide at least three emergency brake operations under W2 loading conditions. Reservoirs shall be set to assist moisture collection and shall include automatic/manual drain valves.	Bidder request is rejected. This requirement shall be demonstrated during design phase.

41.	Volume II Section VI ERT-78 10.3.9 Air Hoses	All flexible hoses shall be date stamped, and its full life indicated. All flexible hose connections on removable assemblies shall be of railway service proven, quick connect coupling. It is confirmed that potential suppliers have never experienced to provide service proven, quick connect coupling for the flexible hose connections. Therefore, the Bidder humbly requests the Employer to accept connections with screw and revise the requirement as proposed revised text.	All flexible hose connections on removable assemblies shall be secured by screw. ~~of railway service proven, quick connect coupling.~~	Bidder request is rejected.
42.	Volume II Section VI ERT-80 1.1.1.5 Performance simulation	Simulation for "constant speed" is requested in this clause, and definition of "constant speed" is described in Clause 11.1.21. From this definition, the Bidder is of the opinion that there is no difference between constant speed and all-out which is requested in clause 11.1.4. Accordingly, the Bidder request the Employer to clarify the difference of constant speed and all-out operation, and to unite to one pattern if they are same or similar.	N/A	Bidder opinion is noted. The propulsion capacity is required to be simulated as per clause 11.1.4 and 11.1.5. 11.1.4 is tor the design capacity simulation and 11.1.5 is for the operation capacity simulation.
43.	Volume II Section VI ERT-90 14.2.2	The APSE shall consist of an auxiliary power inverter (Si- IGBT or Hybrid-SiC Technology, force ventilated), to supply all AC power, and a Low Voltage	The APSE shall consist of an auxiliary power inverter (Si- IGBT or Hybrid-SiC	Bidder request is noted. Please see Annex B.

	APSE cooling method	Power Supply (LVPS) to provide low voltage DC power. And APS shall have HSCB and Fuse to protect from over current. The Bidder understands that the regular maintenance such as cleaning for blower fan and blower replacement is required by customer if the APSE is consisted of forced ventilated. In addition, the failure rate of the APSE is raised by blower fan. However, if the APSE is consisted of self-cooled, there is no cleaning for blower fan and blower replacement, and there are advantages for self-co o led compared to forced ventilated. Accordingly, the Bidder requests the Employer to amend the requirement as proposed revised text.	Technology, self-cooled /forceventilated), to supply all AC power, and a Low Voltage Power Supply (LVPS) to provide low voltageDC power. And APS shall have HSCB and Fuse to protect from over current.	
44.	Volume II Section VI ERT-90 14.2.7 Insulated common point	The output of the LVPS shall be routed to the low voltage distribution panel/cabinet inside the car. The negative return current from each subsystem shall run individually to the Engineer's reviewed insulated common point located in an enclosure under the car.	The output of the LVPS shall be routed to the low voltage distribution panel/cabinet inside the car. The negative return current from each subsystem shall run individually to the Engineer ' s reviewed	Bidder request is accepted. Please see Annex B.

		The Bidder requests the Employer to accept that the insulated common point is also located inside of the car to minimize volume of the wiring for design optimization as proposed.	insulated common point located in an enclosure under or inside of the car.	
45.	Volume II Section VI ERT-92 14.7.9.1 Battery box	The battery shall be installed under the vehicle and shall be accessible from the side of the vehicle. The battery box shall be ventilated by natural air convection and have drain holes. The batteries shall be mounted in a stainless -steel roll-out tray, with positive stops when pulled out and a lock in the stored position. Alkali-resistant paint is applied to the battery box and tray. If Alkali-resistant paint is applied to the battery tray made of stainless steel, it can be easily peeled off after dried and so, the Bidder is of opinion that Alkali-resistant paint should not be applied on the battery tray made of stainless steel. The Bidder respectfully request the Employer to revise the requirement as proposed.	The battery shall be installed under the vehicle and shall be accessible from the side of the vehicle. The battery box shall be ventilated by natural air convection and have drain holes. The batteries shall be mounted in a stainless-steel roll-out tray, with positive stops when pulled out and a lock in the stored position. Alkali-resistant paint is applied to the battery box ~~and tray.~~	Bidder request is rejected.

46.	Volume II Section VI ERT-110 17.8.13 Curve Test Facility	The CP NS-03 Contractor shall provide the facility for the curve test Basically, the signaling contractor simulate the run-curve in accordance with the train performance. In this case the rolling stock contractor have to provide appropriate train performance data to the signaling contractor. Is the Bidder's understating corrects for this requirement? The Bidder requests the Employer to understand that it is impractical to provide the facility for the curve test, and remove this requirement.	~~The GP NS-03 Contractor shall provide the facility for the curve test.~~	This requirement was moved to clause 20.3.8. The requirement is for bogie curve testing. Please see Annex B.
47.	Volume II Section VI ERT-131 20.7.2.4 Testing process	During the test the testing shall be carried out strictly in accordance with the approved test procedure. If additional steps are found to be necessary during testing, the testing shall stop, the test procedure shall be rewritten to include the changes and the procedure shall be submitted to the Engineer for given statement of No Objection. Once approved, the changed test shall be performed. If additional steps are found during the testing, we would like to discuss with the Engineer and determine whether	During the test the testing shall be carried out strictly in accordance with the approved test procedure. If additional steps are found to be necessary during testing, the testing shall stop, the test procedure shall be rewritten to include the changes and the procedure shall be submitted to the Engineer for given statement of No Objection. Once	Bidder request is rejected.

		the test shall be stopped or can continue to proceed. In general, minor change of the test steps are accepted in case by case basis and such changes will be recorded in the test record or minutes of wrap-up meeting and submit it officially as the test repo1i. Accordingly, the Bidder requests to add the proposed sentence at the last sentence.	approved, the changed test shall be performed. However, in the event that the Employer and the Contractor discuss and mutually agree that the testing can be continued, the testing shall not be stopped even if additional steps are found, which shall be conducted at appropriate timing.	
48.	Volume II Section VI ERT-133 21.2.5 Grade Indication of bolts	All bolts and cap screws shall have the head marked to indicate grade. All nuts shall be marked to indicate grade. The Bidder noted that the Bidder's request of Item #25 in GBB #10 was rejected. However, the Bidder respectfully requests the Employer to reconsider accepting our proposed revision because in general, standard hardware doesn't have the head marked and it is beneficial for the Employer to use non-head- marked hardware when the Employer replaces hardware during maintenance. Therefore, we would like the Employer to limit the hardware with the head marked to high- strength hardware.	N/A	Bidder request is rejected. This is project wide requirement.

49.	Volume II Section VI ERT-132 21.4.2.1 Cable Standard	Cables shall conform to EN50264 or other equivalent standards. The Bidder noted that the Bidder's request of Item #26 in GBB # 10 was rejected. However, since cables used in the trains in Japan are service-proven design, and have equivalent reliability and cost efficiency from the maintenance point of view, we respectfully request the Employer to reconsider revising the requirement as proposed.	Cables shall comply with EN standards or Japanese regulations/standards. ~~Conform to EN50264 or other equivalent standards~~	Bidder request is rejected. The requirement has covered the acceptance of a range of equivalent standards.
50.	Volume II Section VI ERT-135 21.4.5.1 Pinch screw terminals	Pinch screw terminals and solid conductors are specifically forbidden. It is standard to use pinch screw terminals on small electric parts and solid conductors are used for the signaling and communication system. Therefore, the Bidder requests the Employer to revise this requirement as proposed.	The Contractor is allowed to use pinch screw terminals as a minimum, and solid conductors are ~~specifically~~ forbidden unless otherwise any specific reasons.	Bidder request is rejected. This is a project wide requirement.
51.	Volume II Section VI ERT-137 21.9.2 IP rating	Enclosures shall be made to IP55 rating or better. The Bidder understand that the requirement of IP55 rating or better in ERT Clause 21.9.2 shall be applied to all equipment enclosures defined in	N/A	Bidder understanding is correct.

		ERT Clause 21.9.1. Please confirm that the foregoing understanding is correct.		
52.	Volume II Section VI ERT-148 24.2.5 Spare Parts	The Bidder understands that only disc brakes shall be applied for this project in accordance with ERT 3.7, where the use of tread brakes is not specified. Accordingly, the Bidder requests to delete Item #6 "Tread Brake Assemblies" from the list of ERT Clause 24.2.5. In addition, the Bidder requests the Employer to clarify whether Item#17 "Unit Brake Assemblies" means the Disc Brake Unit.	N/A	Please see Annex B for the updated item #6 and #17.
53.	Volume II Section VI ERT-176 Appendix H Dwell time	It is understood that the dwell time at each station is 120 seconds and the dwell time at end stations is 1800 seconds as per ERT Clause 11.1.4 5) and 6). If this understanding is correct, the Bidder requests the Employer to revise the numbers in Appendix H accordingly, where 30 seconds at each station and 180 seconds at end stations are specified. In addition, the Bidder requests the Employer to confirm if the Limited Express Trainsets shall stop at	N/A	Appendix H is sample data for reference only. The appendix will not be revised for now. Confirmed on the Buendia station stopping.

		Buendia Station only between CIA and Alabang.		
54.	Volume II Section Vi ERT-156 25.4.7	Training shall include re- railing procedure and actual demonstration involving the new vehicle. It is understood that the re-railing equipment shall be supplied by the Contractor of *CP* NS-01 and so, re-railing procedure and actual demonstration shall be provided by them. Therefore, please delete this requirement from this *CP* NS-03 package and incorporate this into *CP* NS-01 package.	~~Training shall include re railing procedure and actual demonstration involving the new vehicle.~~	Bidder request is accepted. Please see Annex B.
55.	Volume II Section VI ERG-43 7.10.2.1 Software framework	All the software produced or supplied for the Project shall be subject to a defined quality framework. The Contractor shall use a Quality Assurance System which is compliant with ISO 9000 series and meet the requirements as stipulated in the ERG and ERT. ISO 9000-3 is considered appropriate for any software frame work. The quality framework requirements for safety integrity level 2 and above are supplementary to the requirements of IEC62279 or EN 50128. The Bidder is required to use EN50128 or IEC62279 for Software Safety	N/A	Required SIL shall be determined by the Contractor for each safety related function which uses software for control and monitoring. The Contractor will set the SIL at the functional level and functional module level and shall assign that SIL to all systems, sub-systems or LRU's associated with that function. Please see Annex B. Clause 8.1.12.

		Integrity Level (Software SIL) 2. However, the Bidder cannot see any software SIL allocation for any subsystems, equipment and functions in the ERG and ERT. In addition, there is no requirement for performing Software SIL allocation and proposing appropriate Software SIL in ERG and ERT. Accordingly, the Bidder requests the Employer to clarify Software SIL allocation in appropriate clauses in ERG or ERT.		
56.	Volume II Section VI ERG-46 8 System Assurance	Some requirements are added in clause 8 System Assurance form that of North-South Commuter Railway Project (Malolos -Tutuban). However, it appears that some of those additional requirements are in contradict with original requirements. Accordingly, the Bidder requests the Employer to go through all requirements in clause 8 and consolidate each requirement appropriately.	N/A	Please see Annex B.
57.	Volume II Section VI ERG-47 8.1.1 to 8.1.6 System Assurance Management Plan	In these clauses, System Assurance Management plan (SAMP) and System Assurance Plan are used as term definition. The Bidder understands that both should be the same plan according to the		Please see Annex B.

	(SAMP) System Assurance Plan	requirements. Accordingly, if the Bidder ' s understanding is correct, please unify those terms into System Assurance Management Plan or any other appropriate term.		
58.	Volume II Section VI ERG-47 8.1.3 8.1.6	The System Assurance Plan shall cover Reliability, Availability, Maintainability and Safety, Electromagnetic Compatibility (EMC), Fire Safety strategy and System Engineering. The SAMP shall address the Performance (Reliability, Availability, Maintainability and Safety) of the Rolling Stock. EMC, Fire Safety strategy and System Engineering are major engineering activities and usually those plans are separate from the System Assurance Management Plan. Accordingly, those plans should be submitted independently. Therefore, the Bidder requests the Employer to revise the requirement in this clause according to our proposed revised text and transfer them to appropriate clauses such as clause 17.9 in the case of EMC.	The System Assurance Management Plan shall cover Reliability, Availability, Maintainability and Safety. -, ~~Electromagnetic Compatibility (EMC), Fire Safety strategy and System Engineering.~~	Please see Annex B

		Finally, the Bidder understands that SAMP consists of Performance Assurance plan and Safety Assurance Plan.		
59.	Volume II Section VI ERG-47 8.1.7 Fault Free Running (FFR)	Please clarify whether the fault/failure includes only the failure which causes a delay greater than 5-minutes. Or does fault/failure in FFR means all failures?	N/A	Bidder understanding is not correct. The fault free is none fault registered in the TMS fault indication screen and subsystem event logger i.e. PECE, APSE etc.
60.	Volume II Section VI ERG-48 8.2.1 Performance Assurance Plan	Within the SAMP, the Contractor shall submit a Performance Assurance Plan (PAP) or RAM Assurance Plan as per EN 50126 or IEC 62278 or any other equivalent international standard for the Rolling Stock to comply with the Employers Requirement (functional, performance and safety Requirements) and submitted for review by the Employer/Engineer. This clause mentions Performance Assurance Plan/RAM Assurance plan and these requirements, and there is no safety requirement. Accordingly, " Safety requirement" is not necessary. The Bidder requests the Employer to remove the word "safety requirements" in this clause	Within the SAMP, the Contractor shall submit a Performance Assurance Plan (PAP) or RAM Assurance Plan as per EN 50126 or IEC 62278 or any other equivalent international standard for the Rolling Stock to comply with the Employers Requirement (functional and performance ~~and safety~~ requirements) and submitted for review by the Employer / Engineer.	Please see Annex B.
61.	Volume II Section VI	The Bidder believes that "Trail" should be "Trial ". Please clarify and if so,	N/A	Please see Annex B.

	ERG-48 8.5.2.1) Trail Operation	revise it accordingly.		
62.	Volume II Section VI ERG-49 RRG-97 8.5.3.2) ERG Appendix A Table A1 Definitions (OMTTR)	OMTTR - Operational Mean Time To Restore (OMTTR) capital components; the trainsets shall be restored to operational order in an OMTTR of 15 minutes. OMTTR definition: is defined as the average time to restore/normalize Rolling Stock with a fault on the main line Currently the Bidder considers this requirement as follows: When In-service operation is disrupted by any failures in mainline, such failure is restored and trainsets have to be In-service condition available within 15 minutes. If this is correct and the failure requires rescue operation, trainsets cannot be restored to normal order within 15 minutes. Accordingly, please clarify whether such failures are included or not for OMTTR analysis. If our understanding is not correct, the Bidder requests the Employer to provide more information for OMTTR criteria.	N/A	Bidder understanding is not correct. The OMTTR measures the average effective time required to return the train to service after a service affecting failure. Example: Train 1 is a serviceable train and was having a propulsion (Capital Component) fault that caused a motion obstruction, four times in one scheduled day and you spend an hour repairing each of those instances of fault, the OMTTR would be 15 minutes (60 minutes / 4 = 15 minutes)
63.	Volume II Section VI	The Bidder requests the Employer to provide the calculation formula of	N/A	CMTTR is a measurement on the maintainability of

	ERG-48 RRG-97 8.5.3.3) ERG-49 CMTTR	CMTTR for assessing CMTTR whether it meets the CMTTR criteria or not.		equipment and repairable parts. It represents the average time needed to repair a failure until the equipment returns to a fully functional state. Example: Train 1 was taken out from serviceable status to unserviceable and routed back to depot due to propulsion error. The scaled time between the train entered the pit line and declared serviceable by the maintenance / total number of affected capital components is CMTTR: Total train on pit = 8 hours Total affected capital component = 1 Propulsion CMTTR = 8/1 = 8 hours.
64.	Volume II Section VI ERG-49 8.5.4 FMECA	For criticality analysis and risk assessment, please provide the failure category table that include impacts for operation of the train and/or train service and risk matrix table.	N/A	Safety criteria/ target, Risk matrix table etc. shall in general according to EN 50126 or IEC 62278 or any other equivalent international standard for the Rolling Stock.

65.	Volume II Section VI ERG-49 8.6.2.4) FTA	Failure mode, effect, & criticality analysis (FMECA) and Fault Tree Analysis (FTA) The Bidder requests the Employer to confirm what the purpose of conducting FTA for Performance/RAM activity in this contract is. Usually only FMECA is enough for failure analysis and if the preventive measures are not identified and then the failure con sequence will not be solved, conducting FTA is reasonable. Accordingly, when conducting FTA is required, please specify the condition for conducting FTA or revise the requirement according to our proposal at least.	Failure mode, effect, & criticality analysis (FMECA) and Fault Tree Analysis (FTA) **if necessary (only when failure consequence is not solved)**	Please see Annex B.
66.	Volume II Section VI ERG-49 8.6.2.5) Reliability Critical item List	Reliability Critical item list which might impact the operations of the train or train service Please specify the impact for the operations of the train or train service in the failure category table commented in ERG Clause 8.5.4 to identify the Reliability Critical item. Usually such failure category is included in Employer's	N/A	The requested information shall be provided by the Contractor during the project implementation.

		requirement as the criteria for Reliability critical item.		
67.	Volume II Section VI ERG-49 8.6.1 8.6.2 Performance Reports	The Bidder understands that the Performance report is prepared for each trainset and provided to the Employer prior to TOC application. This means that 7 sets of the Performance report should be prepared in total. Is the Bidder ' s understanding correct? In addition, necessary contents for Performance report stipulated in ERG Clause 8.6.2. 1) to 5) are the same for each trainset. Accordingly, the Bidder proposes that one set of performance report which only includes above mentioned materials should be provided for all trainsets at only one time. Regarding the other contents for Performance reports, we clarify in next item.	N/A	Bidder understanding is correct. 7 sets performance report shall be submitted by the Contractor. Bidder proposal is accepted. This shall be outlined in the Contractor configuration management plan etc.
68.	Volume II Section VI ERG-49 8.6.2.6) 8.6.2.7)	Manufacturing Completion Certificate for each train Design Qualification Testing Completion Certificate Factory Acceptance Tests Completion Certificate	N/A	Bidder request is rejected. These certificates shall be in a binder submitted by the Contractor together in the Performance Report for TOC application.

	8.6.2.8) 8.6.2.9) 8.6.2.12) 8.6.2.13)	Train Delivery to site completion Certificate On-site Testing and Commissioning Completion Certificate Train Operation Completion Certificate for each train 1,500 km (FFR) These certificates will be prepared individually for each trainset and provided to the Employer from appropriate department such as Quality Assurance. Accordingly, the Bidder requests the Employer to remove these certificate s from Performance report.		
69.	Volume II Section VI ERG-49 8.6.2.10) 8.6.2.11)	As build drawing Completion of Training program These materials are applicable for all trainsets, not for each trainset individually and provided to the Employer from appropriate department such as Engineering department. Accordingly, the Bidder requests the Employer to remove these materials from Performance report.	N/A	Bidder request is rejected. Please see Annex B.
70.	Volume II Section VI	The Bidder requests the Employer to more explain the relationship	N/A	Clause 8.3 is the Performance (RAM) requirement in order to

	ERG-48, 8.3 ERG-49 8.6.3 & 8.6.3	between ERG clause 8.3 and ERG Clause 8.6.2&8.6.2 to avoid confusion between those requirements.		provide confidence that the final operating system shall achieve the requirements of the performance measures, RAM analyses and assessments shall be undertaken at appropriate stages of the project. Clause 8.6.2 (Rolling Stock TOC Performance report) is the prerequisite for the issuance of TOC and the issuance of performance certificate.
71.	Volume II Section VI ERG-48 8.3.3 ERG-49 8.6.3	The Bidder requests the Employer to more explain the relationship between ERG clause ERG 8.6.3 and ERG Clause 8.3.3. In ERG clause 8.3.3 RAM plan and demonstration reports are required but in ERG clause 8.6.3 Rolling Stock Performance report are required. Are both reports different? Do we have to prepare two different reports? Please clarify.	N/A	They are two different reports. Clause 8.3.3 required the Contractor to provide the plan of assurance of reliability, for operational service. Reliability and availability will be assessed against specific targets laid out by the Employer. The report shall provide evidence that the respective RAM targets have been achieved and shall include any supporting information and calculations.

				This report shall be prepared by the Contractor RAMS engineer. Clause 8.6.3 (Rolling Stock Performance report) is the prerequisite for the issuance of performance certificate which includes the works performance progress i.e. defect remedial, open items, modifications etc. This report shall be prepared by the Contractor PM. The contactor is allowed to make the RAM demonstration report as the annexes of the Rolling Stock Performance Report.
72.	Volume II Section VI ERG-49 8.6.3.1)	In-service FFR operational performance of individual trainsets as per **clause 8.3.3** This clause refers to clause ERG 8.3.3 but it should be ERG clause 8.5.2.2). Please clarify.	N/A	The numbering was updated in GBB 10 dated 25 May 2021 – Please refer to Annex B item 16.

73.	Volume II Section VI ERG-50 8.6.3.2)	In-service operational performance of the fleet (7 trainsets) MDBF as per clause 8.3.3 This clause refers to ERG clause 8.3.3 but it should be ERG clause 8.5.3. 1). Please clarify.		The numbering was updated in GBB 10 dated 25 May 2021 – Please refer to Annex B item 16.
74.	Volume II Section VI ERG-50 8.6.3.3)	The in-service OMTTR and CMTTR of all capital components as per clause 8.3.3 This clause refers to ERG clause 8.3.3 but it should be ERG clause 8.5.3.2) & 3). Please clarify		The numbering was updated in GBB 10 dated 25 May 2021 – Please refer to Annex B item 16.
75.	Volume II Section VI ERG-50 8.8.1.1	The safety assurance program aims to reduce to a **tolerable level the probability of occurrence of catastrophic or critical** events causing damage to assets or harm to any person. The Contractor shall follow appropriate **risk reduction** principle such as ALARP (As Low as Reasonably Possible) todemonstrate the risk acceptance to the Employer. The Bidder requests the Employer to providethe severity level (catastrophic or critical etc.)and probability of	N/A	Safety criteria/ target, Risk matrix table etc. shall in general according to EN 50126 or IEC 62278 or any other equivalent international standard for the Rolling Stock.

		occurrence classification table which include the definitions of each classifications for conducting risk analysis/assessment. In addition, risk matrix table is also necessary for above mentioned activities to demonstrate whether the risk is tolerable or not.		
76.	Volume II Section VI ERG-50 8.8.2.1 8.8.2.2	In clause ERG 8.8.2.1 the Employer requests the Bidder to provide the Safety Assurance Plan (SAP) within System Assurance Management Plan (SAMP) but in ERG clause 8.8.2.2 System Safety Assurance Management Plan is required. Are those different plans? Please clarify and unify the term	N/A	Please refer to Annex B. The term was unified.
77.	Volume II Section VI ERG-51 8.8.3.1 8.8.3.2	Each hazard analyses are required but it appears that the template is not included and specified in the ER. These templates are usually included in ER. Accordingly, the Bidder requests the Employer to provide these templates.	N/A	Safety criteria/ target, Risk matrix table etc. shall in general according to EN 50126 or IEC 62278 or any other equivalent international standard for the Rolling Stock.
78.	Volume II Section VI ERG-51 8.8.3.3	Hazard log management is required but it appears that the template is not included and specified in the ER. Hazard log template is usually included in ER. Accordingly, the Bidder requests the Employer to provide this template.	N/A	Safety criteria/ target, Risk matrix table etc. shall in general according to EN 50126 or IEC 62278 or any other equivalent international standard for the Rolling Stock.

79.	Volume II Section VI ERG-51 8.8.3.4	This clause just specifies to perform safety assessment for example functions given in this clause. However, it appears that there are no criteria, target related to safety for assessment. Accordingly, the Bidder requests the Employer to provide more detailed explanations such as purpose for this assessment etc. in this clause.	N/A	Safety criteria/ target, Risk matrix table etc. shall in general according to EN 50126 or IEC 62278 or any other equivalent international standard for the Rolling Stock. The assessment is to determine the Design, Testing and Commissioning phase and shall also identify modes of operation that are critical to the safe operation of the system, including emergency modes, maintenance and day-to-day operations. The table provided an example only and it is the Contractor obligation under the Works defined in this contract to perform the safety assessment.
80.	Volume II Section VI ERG-51 8.8.3.5	The Bidder requests the Employer to provide the template for Safety Critical Item List and the criteria for identifying this item.	N/A	The safety critical item list and the criteria for identifying the items is the reference to relevant entry in Hazard Log for Safety Critical failure modes.

				Safety criteria/ target, Risk matrix table etc. shall in general according to EN 50126 or IEC 62278 or any other equivalent international standard for the Rolling Stock.
81.	Volume II Section VI ERG-51 8.8.3.7	It appears that the requirement in this clause isincluded in FMECA specified in ERG clause 8.8.3.6. Accordingly, the Bidder requests the Employer to remove this clause.	N/A	The item was deleted. Please see Annex B.
82.	Volume II Section VI ERG-51 8.8.3.8	For performing Quantified Risk Assessment, the Bidder requests the Employer to provide Safety criteria/ target, Risk matrix table etc. mentioned in above clarifications.	N/A	Safety criteria/ target, Risk matrix table etc. shall in general according to EN 50126 or IEC 62278 or any other equivalent international standard for the Rolling Stock.
83.	Volume II Section VI ERG-51 8.8.3.4 8.8.3.8	Please clarify the relationship between the requirement of ERG clause 8.8.3.4 and ERG clause 8.8.3.8. From the objective of both activities the Bidder can understand that both are the same. If the term "Safety" assessment in ERG clause 8.8.3.4 can be changed to other appropriate term, the Bidder would be able to understand correctly the	N/A	The term in 8.8.3.8 was changed. Please see Annex B.

		requirement in ERG clause 8.8.3.4 and relationship between each clause.		
84.	Volume II Section VI ERG-52 8.8.4.2.2)	The Safety requirement is specified in ERG clause 8.8.3 and its clause requires safety assessment in ERG clause 8.8.3.4 as one of the safety requirements. On the other hand, in this clause the Safety assessment report is required to demonstrate the safety requirement. Even though the safety requirement consists of many activities in ERG clause 8.8.3, how does the Safety assessment report demonstrate out of safety requirements from the safety assessment?	N/A	8.8.4.2 (2) was updated. Please see Annex B.
85.	Volume II Section VI ERG-52 8.8.4.2.4)	Design Safety Case and Final Safety Case or Safety report to be submitted for Employer' s given statement of No Objection. The Bidder is required to submit the Design safety case and Final safety case or safety report in this clause. However, with reference to ERG clause 8.8.4.3 and 8.8.4.4, each Safety case are equivalent to each Safety report. What is the differences between Safety case and Safety report in this clause? In addition, is Safety case quoted in this clause the same as the one stipulated in EN50129 / IEC62245 standard?	N/A	The requirement was updated. Please see Annex B.

		Please clarify.		
86.	Volume II Section VI ERG-52 8.8.4.4	Two contents for Operational Readiness Safety "Final safety case" are required but both are unclear. Accordingly, the Bidder requests the Employer to provide more specific information for the preparation of Operational Readiness Safety report " Final Safety case". In addition, this report has to be provided to the Employer for each trainset. Does this mean that the Bidder provides 7 sets of reports individually to the Employer?	N/A	The requirement was updated. Please see Annex B. Design safety case or Safety report is a report which shall be submitted at two stages in the project, which is at the Final Design and Testing and Commissioning. Correct. For TOC application, each train shall have individual binder of performance report as outlined in clause 8.6.2 of ERG.
87.	Volume II Section VI ERG-52 8.8.4.4.2)	8.8.4.4.(2) The Safety Management System to be applied for in-service operations 8.8.2.(1) The SAP shall cover the design, manufacture, testing, commissioning and integrated testing phases, and safety management for in-service passenger operations. The Bidder is required to report applied safety management system for in-service operations. However according	N/A	Clause 8.8.2.1 described the requirement of plan document which shall detail the specific safety related activities planned to be carried out by the Contractor to ensure the design solution and those activities shall cover the design, manufacture, testing, commissioning and integrated testing phases, and safety management for

		to ERG clause 8.8.2.1, applied safety management system for in- service passenger operation is included in the Safety assurance plan. Please clarify what the required contents are in this clause.		in-service passenger operations. Clause 8.8.4.4(2) required the content of Safety Management System to be applied, for in-service operations in the Design safety report (1) or the Safety report updated (2) at the end of the Testing and Commissioning phase Please see Annex B for the updated requirement in clause 8.8.4.
88.	Volume II Section VI ERG-53 8.8.4.5	The Bidder is required to issue the In-service Final Operation Safety report on a monthly basis until end of DNP but according to required contents and the characteristic of this report, it is not necessary of monthly issuing. Accordingly, the Bidder proposes to revise the issuing time from monthly basis to one time issuing at end of DNP.	N/A	Bidder request to issue at the end of DNP is rejected. However, the requirement was updated. Please see Annex B.
89.	Volume II Section VI ERG-53 8.8.4.5.1)	Safety Performance Please clarify the definition and criteria of safety performance for complying with those requirements and issuing In-	N/A	The requirement was updated. Please see Annex B. The safety performance and criteria of safety performance is the tracking

		service Final Operational Safety report The Bidder also considers the requirement of ERG clause 8.8.4.5 by using the response for this clarification.		down failures or incidents which have or may have an impact on safety.
90.	Volume II Section VI ERG-53 8.9.1	The Employer may appoint independent engineers and/or Independent Safety Assessors (ISAs) to assess on compliance with contract requirements on System Assurance. Please clarify whether the Employer appoint independent engineers and/or Independent Safety Assessor or not for estimating appropriate budget.	N/A	The Employer will appoint the independent engineers and/or Independent Safety Assessors (ISAs).
91.	Volume II Section VI ERG-46 8 System Assurance	ERG clause 7.10.2.1 requires the activities of Software SIL but in ERG clause 8 System Assurance, it appears no System/Hardware SIL activities and no reference standard. Accordingly, please clarify whether the Bidder ' s understanding is correct or not. In addition, with reference to above clarification, please also clarify whether dedicated SIL certification by a third-party body such as TUV for Rolling stock design in this contract is newly necessary or not.	N/A	Please see response provided on item #60. Please refer to Annex B. Reference standard was provided in clause 8.1.12. Dedicated SIL certification by a third-party body such as TUV for Rolling stock design is not a mandatory requirement.
92.	Volume II Part 2 SOW-2	Bidder 's understanding is that Inspection, Testing and Commissioning can be also conducted according to JIS	N/A	Clause 1.8 was updated. Please refer to Annex B.

	1.8	E404I, as describes in ERT Clause 20.4.1.1		
93.	Volume II Part 2 ERG-53 8.9.2	8.9.2 The independent assessor may undertake the following: I) Safety audits; 2) Design reviews; 3) Witnessing of testing activities; 4) Review of the safe ty and quality organizational activities; 5) Review of the safety 6) Assessment of safety applications; and 7) Provision of safety 8) recommendations to the employer Bidder' s understanding is that The Independent Safety Assessors may undertake item I), 4), 5), 6) and 7) at on-site only, and that not independent assessor but independent engineer take action for item 2) and 3).	N/A	Bidder understanding is noted. Please see Annex B.
94.	Volume II Part 2 Section VII SOW-2 Clause 1.4	The Contractor shall procure materials, components, and sub- systems which are required for the Rolling Stock manufacturing. The materials to be used in the manufacturing shall be of high quality and comply with relevant	The Contractor shall procure materials, component s, and sub- systems which are required for the Rolling Stock manufacturing. The material s to be used in the	Please see Employer response item #8 GBB 8 dated 19th May 2021. Bidder request is rejected.

	Procurement of Materials, Components and Sub- Systems Scope of Works (SOW)	international standards acceptable to the Employer/Engineer. All materials, components and sub- systems shall be procured from reputable suppliers which ISO 900I certified or working toward this certification. Many sub-suppliers of the Bidder are not ISO 9001 certified, but have different measures in effect to guarantee the quality of the components. Therefore, please accept an equivalent quality management process, in case such component manufacture does not obtain ISO 9001.	manufacturing shall be of high quality and comply with relevant international standards acceptable to the Employer/Engineer. All materials, components and sub- systems shall be procured from reputable suppliers which ISO 9001 certified, or working toward this certification, or have in effect an equivalent quality management process deemed appropriate by the Contractor.	ISO 9001 is the world's most recognized Quality Management System (QMS) standard. A none ISO 9001 certified or working towards ISO 9001 certification organization pose a threat/risk to a major non compliances on schedule and quality to the projects.

Annex B

PACKAGE CP NS-03: ROLLING STOCK - LIMITED EXPRESS TRAINSETS
General Bid Bulletin No. 11
Annex B

ITEM NO.	REFERENCE/CLAUSE/ SECTION	REVISIONS / AMENDMENTS
		Volume II Part 2 – Employer's Requirements
1	ERG-17 4.5.2 (1)	Updated clause 4.5.2 (1): The Contractor shall undertake a survey and needs analysis of PPE requirements for the Works and shall provide all appropriate PPE for his personnel. In addition, the Contractor shall provide 15 sets of PPE each to the Engineer and Employer;
2	ERT-33 2.4.4	Added new clause 2.4.4: In case the Japanese Ministerial Ordinance, Technical Regulatory Standards on Japanese Railways is applied, the cab car shall absorb the collision energy by providing a controlled deformation and collapse of areas of the vehicle which are unlikely to be occupied by the train crew and passengers, to absorb the collision energy and to reduce the deceleration on the train crew and passengers. This shall be validated by the computer simulation such as Finite Element Method (FEM). Clause 2.4.4 is now 2.4.5:
3	ERT-43 4.1.4	Updated clause 4.1.4: The automatic coupler shall, in conjunction with the draft-gear automatically effect mechanical, and pneumatic coupling. It shall also permit separation of units either by manually from the track side and/or remotely from the cab.

PACKAGE CP NS-03: ROLLING STOCK - LIMITED EXPRESS TRAINSETS
General Bid Bulletin No. 11
Annex B

ITEM NO.	REFERENCE/CLAUSE/ SECTION	REVISIONS / AMENDMENTS
4	ERT-58 6.3.3	Updated clause 6.3.3: The minimum declared life shall be 50,000 hours. The lighting shall be powered by 220V AC supply or 100 DC supply.
5	ERT-62 7.3.2	Updated clause 7.3.2: The door system shall be designed to withstand the effects of vibrations and shocks as defined for equipment attachments in IEC61373 or equivalent standard.
6	ERT-90 14.2.2	Updated clause 14.2.2: The APSE shall consist of but not limited to auxiliary power inverter (Si-IGBT or Hybrid-SiC Technology, Self-cooling/force ventilated), to supply all AC power, and a Low Voltage Power Supply (LVPS) to provide low voltage DC power, HSCB and Fuse to protect from over current.
7	ERT-90 14.2.7	Updated clause 14.2.7: The output of the LVPS shall be routed to the low voltage distribution panel/cabinet inside the car. The negative return current from each subsystem shall run individually to the Engineer's reviewed insulated common point located in an enclosure under the car or inside of the car.
8	ERT-110 17.8.13	Clause 17.8.13 was deleted:

PACKAGE CP NS-03: ROLLING STOCK - LIMITED EXPRESS TRAINSETS
General Bid Bulletin No. 11
Annex B

<table>
<tr><th>ITEM NO.</th><th>REFERENCE/CLAUSE/ SECTION</th><th>REVISIONS / AMENDMENTS</th></tr>
<tr><td></td><td></td><td>Added new clause 20.3.8:

The CP NS-03 Contractor shall provide the facility for the bogie curve test.

Clause 20.3.8 is now clause 20.3.9:
Clause 20.3.9 is now clause 20.3.10:
Clause 20.3.10 is now clause 20.3.11:
Clause 20.3.11 is now clause 20.3.12:
Clause 20.3.12 is now clause 20.3.13:
Clause 20.3.13 is now clause 20.3.14:
Clause 20.3.14 is now clause 20.3.15:</td></tr>
<tr><td>9</td><td>ERT-147, 148
24.2.5</td><td>Updated table item 6 and 17:

<table><tr><th>No</th><th>Description</th></tr><tr><td>1</td><td>Wheel and Axle Assembly for Motor;</td></tr><tr><td>2</td><td>Wheel and Axle Assembly for Trailer Bogie;</td></tr><tr><td>3</td><td>Wheel Assembly;</td></tr><tr><td>4</td><td>Primary Suspension;</td></tr><tr><td>5</td><td>Secondary Suspension;</td></tr><tr><td>6</td><td>Brake Caliper Assembles;</td></tr><tr><td>7</td><td>Gearbox Assembly;</td></tr><tr><td>8</td><td>Flexible Coupling Assembly (link for Gear box and Traction Motor);</td></tr><tr><td>9</td><td>Traction Motor Assembly;</td></tr><tr><td>10</td><td>Current Return Assembly;</td></tr></table></td></tr>
</table>

PACKAGE CP NS-03: ROLLING STOCK - LIMITED EXPRESS TRAINSETS
General Bid Bulletin No. 11
Annex B

ITEM NO.	REFERENCE/CLAUSE/ SECTION	REVISIONS / AMENDMENTS		
			11	Air Compressor Assembly;
			12	Air Drier for Compressed Air;
			13	Pantograph Assembly;
			14	Arrestor Assembly
			15	Air Conditioning Unit Assembly;
			16	ACU Compressor Assembly;
			17	Brake Control Unit Assemblies;
			18	Evaporator Blower Assembly;
			19	Air Conditioning Unit (ACU) Control;
			20	Battery Set;
			21	Battery Contactor
			22	Auxiliary Power Supply Equipment;
			23	Replaceable Circuit Boards for (APSE);
			24	Main Control Device (PCE);
			25	Replaceable Circuit Boards for (PCE);
			26	Major sub-assemblies of Main Control Devices;
			27	Master Controller (Rate Controller);
			28	Cab Console Assembly;
			29	Cab Switch Panel;
			30	Cab Relay Board;
			31	Jumper and Cable Assemblies;
			32	Main Circuit Breaker;
			33	CCTV Assemblies;
			34	Semi-permanent Coupler and Draft Gear;
			35	Slewing Ring;

PACKAGE CP NS-03: ROLLING STOCK - LIMITED EXPRESS TRAINSETS
General Bid Bulletin No. 11
Annex B

ITEM NO.	REFERENCE/CLAUSE/ SECTION	REVISIONS / AMENDMENTS		
			36	Destination Sign Assembly;
			37	Door Actuator;
			38	Door Controller;
			39	Interior Panel;
			40	Windows;
			41	Windscreen;
			42	Passenger Door;
			43	Cab Side Door;
			44	Cab Saloon Door;
			45	Passenger Seats;
			46	Drivers Chair;
			47	Panels of Cab;
			48	Interior Lights;
			49	Exterior Lights (head light, brake light, etc.);
			50	Wiper Assembly;
			50	Washer Tank;
			52	Horn Assembly;
			53	Train Management System;
			54	Glass of Windows and Doors;
			55	Flooring Material;
			56	Power Electronic Control Equipment (PECE);
			57	Brake Control Unit (BCU); and
			58	Any other items.
			59	2 Spare Trailer Bogies Complete

PACKAGE CP NS-03: ROLLING STOCK - LIMITED EXPRESS TRAINSETS
General Bid Bulletin No. 11
Annex B

<table>
<tr><th>ITEM NO.</th><th>REFERENCE/CLAUSE/ SECTION</th><th>REVISIONS / AMENDMENTS</th></tr>
<tr><td></td><td></td><td><table>
<tr><td>60</td><td>2 Spare Motor Bogies Complete</td></tr>
<tr><td>61</td><td>Spare trailer bogie wheels – 1 trainset</td></tr>
<tr><td>62</td><td>Spare motor bogie wheels – 1 trainset</td></tr>
<tr><td>63</td><td>Axle bearings</td></tr>
<tr><td>64</td><td>Brake discs, 1 trainset</td></tr>
</table></td></tr>
<tr><td>10</td><td>ERT-156
25.4.7</td><td><u>Deleted clause 25.4.7:</u></td></tr>
<tr><td>11</td><td>ERG-48</td><td><u>Added new clause 8.1.12:</u>

The Contractor shall propose design, implementation techniques and measures, depending on the SIL of the function in line with the principles of EN50128 and EN50129 or other equivalent standard subject to the given notice of no objection by the Engineer.</td></tr>
<tr><td>12</td><td>ERG-46 – 53
Clause 8</td><td><u>Updated clause 8.1.3:</u>

The System Assurance activities shall cover Reliability, Availability, Maintainability and Safety, Electromagnetic Compatibility (EMC), Fire Safety strategy and System Engineering. shall cover the System Assurance Management, System Safety (including the Electromagnetic Compatibility (EMC), Fire Safety strategy), Software Management and Control, Reliability, Availability, Maintainability (RAM) and Requirement Management. The SAP shall include (but not be limited to) the following details: Project Organization; Roles and Responsibilities; Assurance processes and outputs; System Safety processes and outputs; RAM processes and outputs; Requirements management processes and outputs; Assurance Reporting; and Timescales for Assurance Activities.</td></tr>
</table>

ITEM NO.	REFERENCE/CLAUSE/ SECTION	REVISIONS / AMENDMENTS
		Updated clause 8.1.4: The System Assurance Management Plan shall comprise a programme showing in detail the timing of each activity and the anticipated dates for submission of system assurance documentation. The programme will break down the planned activities into discrete stages of work as a minimum design, manufacturing, installation, testing and commissioning and RAM demonstrations. Updated clause 8.1.5: The Plan shall clearly identify the reviews to be performed at the end of each stage of the programme. The Contractor shall convene formal System Assurance Review (SAR) meetings to review all SA activities and to ensure operational hazards are comprehensively identified within the scope of the Contract. The SAR meetings shall be held quarterly, or when there is any key system change, and meeting records shall be submitted by the Contractor to the Employer. The Employer and the Engineers may participate in the SAR. System Assurance Report shall be submitted at the end of each stage of the programme which covered all the subjects above. The Contractor's subcontractor or supplier shall provide the SAMP which will be in consistent in approach with the Contractor SAMP. Updated clause 8.1.6: The SAMP shall be certified by the Contractor's internal department or by a third-party independent engineer from the design and manufacturing section. The SAMP shall be specifically developed for this Contract.

ITEM NO.	REFERENCE/CLAUSE/ SECTION	REVISIONS / AMENDMENTS
		Updated clause 8.1.11: The Employer shall conduct compliance audits during design, development, manufacture and testing and commissioning phases to ensure that the Contractor has met all relevant System Assurance requirements. The Engineer shall give 7 days' notice to the Contractor about the audit arrangement. The Contractor shall provide all necessary assistance to enable the Employer or his representative complete the audit. Added clause 8.1.12: The Contractor shall propose design, implementation techniques and measures, depending on the SIL of the function in line with the principles of EN50128 and EN50129 or other equivalent standard subject to the given notice of no objection by the Engineer. Updated clause 8.2.1: Within the SAMP, the Contractor shall submit a Performance Assurance Plan (PAP) or RAM Assurance Plan as per EN 50126 or IEC 62278 or any other equivalent international standard for the Rolling Stock as an assurance of reliability, for operational service. Reliability and availability will be assessed against specific targets laid out in this tender. In order to provide confidence that the final operating system shall achieve the requirements of the performance measures, RAM analyses and assessments shall be undertaken at appropriate stages of the project by the Contractor. The PAP shall describe the activities that the Contractor proposes to carry out during the life cycle of the design, implementation and operation of the Rolling Stock, to ensure that design solution will ultimately provide a level of assurance that the project availability requirements have been achieved.

PACKAGE CP NS-03: ROLLING STOCK - LIMITED EXPRESS TRAINSETS
General Bid Bulletin No. 11
Annex B

ITEM NO.	REFERENCE/CLAUSE/ SECTION	REVISIONS / AMENDMENTS
		Updated clause 8.2.2: Since availability is a function of reliability and maintainability, the Contractor shall require to carry out reliability and maintainability analysis to show the system availability targets will be met and have been achieved by the end of the Demonstration phase. Updated clause 8.3.3: The Contractor shall provide RAM Management Plan (Can be part of Systems Assurance Management plan), RAM Analysis Report, RAM Demonstration Test, Maintainability Demonstration Test Plan, FMECA Analysis Report, RAM Demonstration Report and DRACAS report as necessary in the relevant stages of the project. Added clause 8.3.4: RAM Management Plan shall include the strategy for the management of RAM and safety issues and define the specific tasks to be performed throughout all the lifecycle of the project. Added clause 8.3.5: The Contractor shall establish and include procedure of Fleet Defect (Pattern Defect) of the rolling stock which shall not limited to issuance of a failure analysis report (FAR), the engineering design change, restart of RAM demonstration of the effected components and extended of warranty of the affected components.

PACKAGE CP NS-03: ROLLING STOCK - LIMITED EXPRESS TRAINSETS
General Bid Bulletin No. 11
Annex B

ITEM NO.	REFERENCE/CLAUSE/ SECTION	REVISIONS / AMENDMENTS
		Added clause 8.3.6: In case of a safety critical failure, the contractor shall establish and include the procedure which shall not limited to issuance of a failure analysis report (FAR), shutdown the system operation, the containment plan and restriction special instruction as corrective action, the engineering design change, restart of RAM demonstration of the effected components and extended of warranty of the affected components. Clause 8.3.4 is now 8.3.7: Clause 8.3.5 is now 8.3.8:
13	ERG-48 8.5.2 (1)	Updated clause 8.5.2 (1): Trial Operation (selected trainset) – No major faults.
14	ERT-49 8.6.2	Updated clause 8.6.2: The Rolling Stock TOC Performance report shall be issued for each trainset prior to operational acceptance and shall provide: 1) Technical design justification of performance; 2) Cross reference to Rolling Stock performance in a similar application; 3) The design prediction at LRU (Line replaceable unit) level (MDBF, OMTTR and CMTTR) of

ITEM NO.	REFERENCE/CLAUSE/ SECTION	REVISIONS / AMENDMENTS
		all capital components; 4) Failure mode, effect, & criticality analysis (FMECA) and Fault Tree Analysis (FTA), FTA shall only applicable to new or critical subsystem equipment or when failure consequences is not solved. 5) Reliability Critical item list which might impact the operations of the train or train service, 6) Manufacturing Completion Certificate for each train, 7) Design Qualification Testing Completion Certificate, 8) Factory Acceptance Tests Completion Certificate, 9) Train Delivery to site completion Certificate, 10) Design Safety Case of Safety Report, 11) Engineer Notice of No Objection of submitted list of As-built Drawing, 12) Engineer Notice of No Objection of completion of Training program, 13) On-site Testing and Commissioning Completion Certificate for each train, and 14) Train Operation Completion Certificate for each train 1500 km (FFR)
15	ERG-50-51 8.8.2	Updated 8.8.2: System Safety Management Plan (SMP) Updated 8.8.2.1:

PACKAGE CP NS-03: ROLLING STOCK - LIMITED EXPRESS TRAINSETS
General Bid Bulletin No. 11
Annex B

ITEM NO.	REFERENCE/CLAUSE/ SECTION	REVISIONS / AMENDMENTS
		Within the SAMP, the Contractor shall provide a Safety Management Plan (SMP) for review by the Engineer however the document shall detail the specific safety related activities planned to be carried out by the Contractor to ensure the design solution will ultimately provide a level of assurance that the project safety requirements have been achieved.. The SMP shall cover the design, manufacture, testing, commissioning and integrated testing phases, and safety management for in-service passenger operations. The Plan shall further identify how the magnitude and seriousness of events or malfunctions which could result in harm to passengers or staff and damage to equipment or property will be minimized. Updated 8.8.2.2: System Safety Management Plan shall detail, but not limited to, the following:
16	ERG-52 8.8.3.6	Deleted clause 8.8.3.6: Clause 8.8.3.7 is now 8.8.3.6: Clause 8.8.3.8 is now 8.8.3.7: Updated clause 8.8.3.7: The Contractor shall provide Quantitative Risk Assessment for the “top events” related to Hazard; for example:

PACKAGE CP NS-03: ROLLING STOCK - LIMITED EXPRESS TRAINSETS
General Bid Bulletin No. 11
Annex B

ITEM NO.	REFERENCE/CLAUSE/ SECTION	REVISIONS / AMENDMENTS
17	ERG-52 8.8.4.2 (2)	Updated clause 8.8.4.2 (2): Design Safety Requirement demonstrating the safety requirements are in compliant with Technical Requirements (ERT)
18	ERG-52 8.8.4.2 (4)	Updated clause 8.8.4.2 (4): Design Safety Case or Safety report to be submitted for Employer's given statement of No Objection.
19	ERG-53 – 54	Updated clause 8.8.4.3: The Rolling Stock Design Safety report "Design Safety case" shall provide: 1) Technical Justification for Rolling Stock safety; and 2) Cross reference to a generic Rolling Stock safety application of similar product provided. 3) Statement on the safety of the design, to be made following the conclusion of each design phase. It shall summaries the findings of all the safety management activities and shall be supported by the results of safety and other assessments which directly or indirectly support any claims made for the safe design of the system. Added clause 8.8.4.4: The Contractor shall submit the System Safety Demonstration Plan and Report. System Safety Demonstration activities and methods shall comply with IEC 61508 or other equivalent standard subject to the given notice of no objection by the Engineer.

ITEM NO.	REFERENCE/CLAUSE/ SECTION	REVISIONS / AMENDMENTS
		Added clause 8.8.4.5: Where software is involved, demonstration of the Software SIL (SIL) shall be performed in accordance with EN 50128 or other equivalent standard subject to the given of notice of no objection by the Engineer as per clause 7.10.2.1. Clause 8.8.4.4 is now 8.8.4.6: Subsequent to the implementation of the recommendations mentioned in the Design Safety Case or Safety Report and the results of the various testing activities, the Design Safety Case or Safety Report shall be updated at the end of the Testing and Commissioning phase and submitted to the Engineer for review. The Design Safety Case or Safety Report shall be provided for each trainset at their TOC and shall provide: 1) The Safety application for in-service operations; and 2) The Safety Management System to be applied for in-service operations. 3) Identify modes of operation that are critical to the safe operation of the system, including emergency modes, maintenance and day-to-day operations. The final report shall be a statement on the safety of the system to substantiate all claims made against safety made within the design phase, with particular recourse to testing of the safety function of any part of the system and degraded safety-mode testing (i.e. to test where safe system operation is still possible, despite system failures). Deleted clause 8.8.4.5: Added clause 8.8.4.7:

PACKAGE CP NS-03: ROLLING STOCK - LIMITED EXPRESS TRAINSETS
General Bid Bulletin No. 11
Annex B

ITEM NO.	REFERENCE/CLAUSE/ SECTION	REVISIONS / AMENDMENTS
		Safety Monitoring during DNP: 1) The Contractor shall specifically track down failures or incidents which have or may have an impact on safety as per clause 8.3.6; 2) The monitoring report shall be included in the DRACAS report and shall be issued progressively on a monthly basis and finalized at the end of DNP. The report shall provide: i) Safety Performance; ii) Safety recommendation; and iii) As per clause 8.3.6
20	SOW-2 1.8	<u>Updated clause 1.8:</u> The Contractor shall test all vehicles to ensure compliance to the specified performances in the ERT. Tests are categorized into Factory Acceptance Test (FAT), Site Acceptance Test (SAT), Testing and Commissioning. For the on-site testing and commissioning, the test shall follow requirements of JIS E4041 or other equivalent standards like IEC 61133 as a minimum. FAT shall be conducted at the manufacturer's facility with SAT, Testing and Commissioning being conducted after delivery to the Site.

PACKAGE CP NS-03: ROLLING STOCK - LIMITED EXPRESS TRAINSETS
General Bid Bulletin No. 11
Annex B

ITEM NO.	REFERENCE/CLAUSE/ SECTION	REVISIONS / AMENDMENTS
		System Integration Test (SIT) shall be conducted by the Contractor together with Signaling, Telecommunications and other Contractors. The Contractor shall provide the necessary technical support to ensure the interface for each vehicle function satisfactorily as stipulated in this Contract.
21	ERG-53 8.9.2	Updated clause 8.9.2: The independent assessor may undertake the following: 1) Assess on compliance with contract requirements on System Assurance; 2) Safety audits; 3) Review of the safety and quality organizational activities; 4) Review of the safety processes; 5) Assessment of safety applications; and 6) Provision of safety recommendations to the Employer.
Volume III Part 3 – Conditions of Contract and Contract Forms		
22	Section VIII Particular Conditions Part B – Specific Provisions 4.2 Performance Security	Replace Specific Provision item 4.2 with the following; **Add the following Paragraph after the existing second paragraph:** "The Performance Securities shall be issued by a reputable bank or financial institution selected by the Contractor and consented to by the Employer, located and authorized to do business in the Republic of the Philippines.

PACKAGE CP NS-03: ROLLING STOCK - LIMITED EXPRESS TRAINSETS
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		The Contractor may obtain such a Performance Security from a foreign bank, subject to the Performance Security being "confirmed" by a reputable bank or financial institution consented to by the Employer, located and authorized to do business in the Republic of the Philippines. In case the Contractor is a joint venture, the Performance Security issued by it will be in the name(s) of one of the followings: (a) in the name of the joint venture, in case of a legally incorporated joint venture at the time of award of contract; (b) in the names of all members of the joint venture in case that the joint venture has not been legally constituted into a legally enforceable a joint venture at the time of award of contract."

Annex B – Attachment 1

4) The Contractor shall require to liaise with the hospitals and fire stations located in the neighborhood for attending to the casualties promptly. The Contractor shall conduct an onsite emergency drill in every month for all of his workers and his subcontractor's workers before starting work on the Site. The Contractor shall ensure that all of his personnel are:

   a) Informed of the procedure for calling the Fire Brigade and other emergency services; and
   b) Informed of and understand fully the evacuation procedures from the Work site(s).

4.5.2 Personal Protection

4.5.2.1 Personal Protective Equipment (PPE)

1) The Contractor shall undertake a survey and needs analysis of PPE requirements for the Works and shall provide all appropriate PPE for his personnel. In addition, the Contractor shall provide 15 sets of PPE each to the Engineer and Employer;

2) The PPEs and safety appliances provided by the Contractor shall be of the required standard. If materials conforming to standards are not available, the Contractor as given Notice of No Objection by the Employer shall procure PPE and safety appliances as soon as possible, in liaison with the Employer;

3) The Contractor shall provide and enforce the wearing of given Notice of No Objection safety helmets and footwear and where necessary, eye goggles, ear protectors, safety harnesses, safety vests and other Personal Protective Equipment. The Contractor shall ensure that all persons on Site wear PPE at all times in areas where PPE is required; and

4) Wherever work is carried out on or near to the NSCR facilities, particularly at a carriage way, or adjacent to a public way, the Contractor shall ensure that personnel shall, at all times, wear high visibility fluorescent garments.

4.5.2.2 Permit to Work.

1) Wherever there are potentially hazardous conditions, the Contractor shall consider whether operating a "Permit to Work" system would reduce the hazards; and

2) The Contractor shall secure necessary work permits where statutory requirements exist.

   a) The Contractor shall develop a work permit system, which is a formal written system used to control certain types of work that are potentially hazardous. A work permit is a document, which specifies the work to be done, and the precautions to be taken. Work permits form an essential part of safe systems of work for many construction activities. They allow work to start only after safe procedures have been defined and they provide a clear record that all foreseeable hazards have been considered. Permits to work are usually required in high-risk areas as identified by risk assessments.

4.5.3 Safety of Equipment of the Contractor

4.5.3.1 Contractor's Equipment, Tools, and Vehicles

1) The Contractor shall ensure that their own and their subcontractor's tools, equipment and vehicles required for the execution of the Works are maintained in a safe condition and are used only by trained operators; Equipment shall be examined and checked by the Contractor prior to delivery to Site or placed into service to ensure that it is operating in a safe mode;

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identical cab cars at tare weight, having the same mass at relative speed between them 25km/h on level and tangent track. The cab car shall absorb collision energy by providing a controlled deformation and collapse of areas of the vehicle which are unlikely to be occupied by Train Crew and passengers, to absorb collision energy and to reduce the deceleration on the Train Crew and passengers. This shall be validated by computer simulation such as Finite Element Method.

2.4.2 The Contractor shall submit the details of the design cases, together with the validation process to be adapted, to the Engineer for review and comments.

2.4.3 As an alternative, the Contractor shall propose the crash worthiness, in accordance to the Japanese Ministerial Ordinance, MLIT or EN 15227 C-II or equivalent, subject to the Engineer's review.

~~2.4.3~~2.4.4 In case the Japanese Ministerial Ordinance, Technical Regulatory Standards on Japanese Railways is applied, the cab car shall absorb the collision energy by providing a controlled deformation and collapse of areas of the vehicle which are unlikely to be occupied by the train crew and passengers, to absorb the collision energy and to reduce the deceleration on the train crew and passengers. This shall be validated by the computer simulation such as Finite Element Method (FEM).

~~2.4.4~~2.4.5 The Contractor shall submit the details of the design cases, together with the validation process to be adapted, to the Engineer for review.

2.5 Jacking and Lifting Requirements

2.5.1 Jacking and lifting points/pads shall be provided for normal maintenance operation, sized and positioned to accept lifting equipment. In addition to these jacking and lifting points, emergency jacking and lifting points shall also be provided at all four corners and at the center of each vehicle end to allow jacking/ lifting under emergency situation, including derailment.

2.5.2 The locations of all jacking and lifting points shall be clearly accessible and marked on the carbody.

2.5.3 The carbody shell shall be designed and tested to allow an empty vehicle, with bogies attached, to be lifted at the extreme ends at the bolster jacking pads, or any combination thereof (particularly during re-railing operations), without exceeding the yield strength of any portion of the carbody.

2.6 Car Roof

2.6.1 Roof construction shall be sufficiently robust as to allow several maintenance personnel to walk over the roof at one time, without causing undue deflection or permanent deformation. Rain gutters shall run for the full length of the vehicles to prevent the spillage of rainwater over passengers when the train is entering or leaving stations. Both ends of the vehicle shall have gutters with adequate water drainpipe that runs to the lowest possible point under the vehicle.

2.6.2 A roof mat under and around the pantograph area shall be installed for electrical insulation and anti-slip protection. In addition, anti-slip surface shall also be provided along the side of the roof covering the whole length of the vehicle.

2.7 Floor

2.7.1 The floor and its mounting structure shall be designed to withstand any loading condition specified herein, for over 30 years in normal operation of the train.

2.3.2.3 The carbody shell shall be designed to withstand a minimum compressive load of 490kN and tensile end load of 350 kN applied through the draft gear attachment points, in combination with the most adverse vertical loading associated with the W2 loading conditions. For all load cases, all carbody members shall remain elastic, with no evidence of buckling.

2.3.2.4 The carbody shell shall be designed and tested to ensure that under W2 loading conditions positive camber exists between bogie centers. The Contractor shall ensure, and must demonstrate by test, that all doors operate freely under all carbody loading conditions and will not disengage from their guide ways under the lateral loading conditions exerted by crush-loaded passengers.

2.3.2.5 The Contractor shall also design and test the doorposts, the corner posts and the Driver's cab end structure in accordance with the latest industry practices.

2.3.3 Airtight body structure

2.3.3.1 In the future, the new line between Clark station and New Clark City station will be open. The new line plan has some tunnel and maximum operation speed is160km/h. Airtight structure is required for rolling stock body.

2.3.4 Gangway

2.3.4.1 Between the car, Gangway must be installed and airtight structure is recommended. At the end of the car, the automatic door shall be provided for shut down the outside noise. Car end door and gangway passage height shall be more than 1850mm and width more than 800mm. The gangway door design, material and its construction shall comply with the Fire Safety requirement as per clause 21.8 of this ERT.

2.4 Crash Worthiness Requirements

2.4.1 Condition of the crashworthiness design shall be head-to-head collision between two identical cab cars at tare weight, having the same mass at relative speed between them 25km/h on level and tangent track. The cab car shall absorb collision energy by providing a controlled deformation and collapse of areas of the vehicle which are unlikely to be occupied by Train Crew and passengers, to absorb collision energy and to reduce the deceleration on the Train Crew and passengers. This shall be validated by computer simulation such as Finite Element Method.

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2.5 Jacking and Lifting Requirements

4 Coupler and Draft Gear

4.1 General

4.1.1 The end cars in each train shall be fitted with an automatic coupler. The coupler shall be placed in a readily accessible position under and from either side of the end vehicle. The position (right side or left side) of parts operated shall be consistent for all end vehicle. It shall be possible to connect with other commuter train of North-South Commuter Railway (NSCR), North-South Railway Project-South, MMSP Line (NSRP-South) without any adapter during train rescue or hauling.

4.1.2 The automatic coupler shall be able to couple with other types of rail vehicle with, if necessary, an adaptor. The adaptor, if required, shall be provided by the rolling stock supply Contractor.

4.1.3 The automatic coupler shall be able to connect a unit with the coupler of another unit on all curves in the depots and main line. The coupler height, measured from the center of the coupler to the top of rail, shall be within 880 mm +10/-15 mm.

4.1.4 The automatic coupler shall, in conjunction with the draft-gear automatically effect mechanical, ~~electrical~~ and pneumatic coupling. It shall also permit separation of units either by manually from the track side and/or remotely from the cab.

4.1.5 In both leading cars, an electrical connecting plug which is necessary for relief operation by connecting train-sets shall be equipped. Also, an emergency connection cable that connects this electrical connection plug shall be equipped. By using this connecting cable, required functions such as brake command, broadcasting, buzzer etc. shall operate properly. Length and diagram of cable shall be also consistent with other commuter trains of NSCR, NSPR-South, MMSP. The position of this plug shall be consistent with other commuter trains of NSCR, NSRP-South, MMSP particularly length of cable shall be determined in consideration of the severest deviations during coupled with other train. Basically, utilization of adapter shall not be acceptable.

4.1.6 The Contractor shall provide the required cabinet for housing the emergency connection cable on the train. Alternatively, the Contractor shall provide proper mechanism for retaining the emergency connection cable when it is not in used.

4.1.7 All electrical connections shall be made to terminal blocks in junction boxes compliant with IP 65, via jumper cables, using quick connect/disconnect couplings securely locked with wire.

4.1.8 Cable hoses shall be made out of high quality, weather and abrasion resistant insulated rubber.

4.1.9 The connectors for each cable, if of the same size, shall be keyed differently to prevent misconnection, and shall be color coded to enable connectors to be easily distinguished.

4.1.10 In all cases, care shall be taken to ensure that strain relief is provided for all cables leaving the junction boxes, and that all cables are properly supported in suitable cleats, and that no chafing of the cabling takes place under all possible movements of the coupler.

4.1.11 The arrangement shall prevent damage from coupling with misaligned couplers, and shall minimize damage to the carbody wiring, should excessive tension be applied to the cables in the event of an accident.

4.1.12 The couplers shall be designed to prevent the coupler swinging transversely when it is not coupled.

4.1.13 Couplers and draft gear shall be capable of withstanding all coupling, buffing and draft

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along with offering both variable and automatic illumination adjustment.

6.3.3 The minimum declared life shall be 50,000 hours. The lighting shall be powered by 220V AC supply or 100 DC supply.~~.~~

~~6.3.4 The lighting throughout the passenger saloon area shall be 300 Lux when measured at 1.2m above the floor.~~

~~6.3.5~~6.3.4 The lighting intensity at passenger sitting reading level (500mm above seat level) shall be no less than 400 lux and at 850 mm above floor level no less than 200 lux. Passenger saloon lighting will have no significant dark areas behind the diffusers. Alternatively, the lighting intensity shall be designed in accordance with EN13272 or any equivalent standard and which shall meet the safety requirement, provide a comfortable and pleasing visual environment.

~~6.3.6~~6.3.5 The main passenger lights circuit will be protected from abnormal currents via a separate circuit breaker.

~~6.3.7~~6.3.6 No single point failure shall cause the loss of more than 50% of interior lighting. The remaining illumination shall be distributed along the entire car length.

~~6.3.8~~6.3.7 Unit type LED shall be aesthetically pleasing. The cover of LED lighting shall be required to comply with the fire safety requirements given in the clause 21.8 of this ERT.

6.4 Passenger Emergency Lighting

6.4.1 The emergency lighting shall be configured at 30% or more from the total number of main lighting. The emergency lighting shall operate when there no present of overhead power and the failure of Auxiliary Power Supply Equipment (APSE).

6.4.2 Emergency lighting shall be provided by LED lighting with the capacity to allow lighting to be provided within all Passenger saloons, at all inter-car locations and in the both saloon and entrance room, which shall be powered by the battery.

6.4.3 The minimum emergency lighting levels for the period of 60 minutes after APSE failure shall be a minimum of 30 lux at all exit thresholds, a minimum of 30 lux at floor level along all walkways, a minimum of 20 lux 750mm above floor level in vestibules and gangways and a minimum of 20 lux for all emergency equipment cubicles. Alternatively, the emergency lighting levels shall be designed in accordance with EN13272 or any equivalent standard and which shall meet the safety requirement, provide a comfortable and pleasing visual environment.

6.4.4 The emergency passenger lights circuit shall be protected from abnormal currents via a separate miniature circuit breaker.

6.4.5 In the event of loss of the overhead supply, the battery shall be able to support all essential services, such as lighting, ventilation, etc. for 60 minutes.

6.5 Exterior Lights

6.5.1 The Contractor shall provide LED type headlights.

6.5.2 Headlight shall have two functions. One is down lighting mode. Another is high-beam mode. The Contractor shall ensure that the state of the headlight is available in the TMS monitor.

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The gangway shall be able to maintain and continue constant braking force during opening and closing operation and shall be robust. The width of gangway shall be more than 800mm. The gangway specification shall be submitted to the Engineer for review and comments.

7.1.21 Doors for saloon separation shall be provided at each vehicle. Separation doors shall open and close automatically when detecting passengers approaching. Suitable damping shall be necessary at the end of the open and close stroke. Stroke and dumping shall be adjusted automatically. It shall be necessary to detect and alarm trouble caused such as trapping passengers or baggage etc.

7.2 Cab Doors

7.2.1 A sliding or both side open type hinged door shall be provided for the Driver's Cab, within the passenger saloon to allow ingress/egress of the train crew. The hinge door shall open into the passenger compartment.

7.2.2 In addition, a hinged door shall also be provided on both side of the driver's cab to allow direct ingress/egress of drivers to and from station platform and the depot. The side doors shall contain a vertical sliding window. The side doors shall open inwards only.

7.2.3 The side doors shall be manufactured from the same material used in the construction of the carbody shell and shall incorporate the same exterior finish.

7.2.4 The cab doors from the passenger saloon (sliding door or hinged) and the side doors (hinged) shall be able to be locked manually using the same key. Similarly, these doors shall be able to lock and unlock from inside the driver's cab without a key.

7.2.5 The side doors lock shall be accessible from both ground level and platform level.

7.2.6 The cab doors design shall be submitted to the Engineer for review and comments.

7.3 Passenger Door, Operators and Controls

7.3.1 Passenger Door operators shall be service-proven in tropical condition and in similar environment to that of the Metro Manila.

7.3.2 The door system shall be designed to withstand the effects of vibrations and shocks as defined for equipment attachments in ~~EN 12663~~IEC61373 or equivalent standard.

7.3.3 There shall be local audible and visual indications to Passengers (to be submitted by the Contractor for the Engineers review), during the door release sequence as well as prior to and during the door closing sequence and there shall be a delayed of 1 second prior to opening or closing the doors.

7.3.4 No part of any door, door installation, door control system or any other components for use with the door systems, shall be capable of causing injury to passengers or personnel as a result of door operation. Particular attention shall be paid to trapped obstacles in the passenger doors. And where door open sequences are not completed normally, the sequences shall not be hold to prevent unintended opening door.

7.3.5 No spurious electrical signals shall cause any door to be released or opened unintentionally, particularly when the train is in motion.

7.3.6 Each pair of saloon doors shall be provided with interlock switches incorporated in the Door Control Circuit to prove that doors are closed. When the Door Control Circuit is

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output load.

~~14.1.4~~14.1.6 The DC output shall be regulated within ±1% for all variations in input voltage and controlled not to damage the battery that has been floating charge.

~~14.1.5~~14.1.7 Sufficient capacitor shall be equipped when the pantograph leaves from overhead catenary instantaneously, the power supply of APSE shall not stop. This guarantee time shall be reviewed by the Engineer.

~~14.1.6~~14.1.8 The Contractor shall submit the required capacity calculation considering 10 cars train-sets in the future extension and reviewed by the Engineer.

~~14.1.7~~14.1.9 The design of the auxiliary electrical system shall have sufficient capacity to provide backup power for normal operation of the emergency loads even in the event of lost overhead power. The design of the auxiliary electrical system and its capacity, including the backup power, shall be reviewed by the Engineer.

~~14.1.8~~14.1.10 This system shall have fuse and HSCB.

14.2 Auxiliary Power Supply Equipment

14.2.1 ~~Two (2) cars in the 8-cars train-set shall be equipped with~~The Auxiliary Power Supply Equipment (APSE) shall capable of supplying all loads continuously. The failure of an APSE shall be enunciated in the Driver's cab and shall be recorded in the TMS and APSE. At least one dead battery start feature ~~device~~ shall be incorporate in one train-set, which shall be located in the Driver's cab.

14.2.2 The APSE shall consist of but not limited to ~~an~~ auxiliary power inverter (Si-IGBT or Hybrid-SiC Technology, Self-cooling/force ventilated), to supply all AC power, and a Low Voltage Power Supply (LVPS) to provide low voltage DC power.~~. And APS shall have~~ HSCB and Fuse to protect from over current.

14.2.3 When designing the auxiliary power inverter, particular care shall be taken to account for the simultaneous starting of large auxiliary loads, such that rapid cycling is avoided (particularly the VAC compressor). The inverter shall use a control scheme that contains extensive self-diagnostic logic, and receptacles shall be placed in the vehicle interior and exterior to allow the connections to any necessary test equipment.

14.2.4 The chassis of APSE shall be with the use of aluminum alloys or other suitable materials which suitable for use on railways vehicles which are subsequently subjected to vibration and shock owing to the nature of railway operating environment.~~.~~

14.2.5 The auxiliary power inverter output transformer shall be galvanically isolated, and the secondary windings shall incorporate a ground fault protection system. Upon detection of a ground fault, a fault message shall be transmitted to the TMS.

14.2.6 The LVPS shall provide the power to all system controls, including the Power Conversion Equipment, friction brakes (computer, brake control units, dump valves, etc.), VAC equipment, lighting, communication equipment, doors, radio, ATP, etc. The LVPS shall be solid-state and shall contain appropriate transient suppression and protective circuitry. The LVPS shall also incorporate appropriate fault and operation indicating lights and test switches. The failure of an LVPS shall be recorded in the TMS and APSE. Logged fault into the TMS and APSE shall be stored and remain until certain number of faults. APSE shall have ordinary-speed and high-speed trace function. In high-speed trace function, logged fault related to the switching of element and behavior of instantaneous current and voltage etc. shall be required to be available for fault diagnostic analysis.

14.2.7 The output of the LVPS shall be routed to the low voltage distribution panel/cabinet

shall be reviewed by the Engineer.

14.1.8 The Contractor shall submit the required capacity calculation considering 10 cars train-sets in the future extension and reviewed by the Engineer.

14.1.9 The design of the auxiliary electrical system shall have sufficient capacity to provide backup power for normal operation of the emergency loads even in the event of lost overhead power. The design of the auxiliary electrical system and its capacity, including the backup power, shall be reviewed by the Engineer.

14.1.10 This system shall have fuse and HSCB.

14.2 Auxiliary Power Supply Equipment

14.2.1 The Auxiliary Power Supply Equipment (APSE) shall capable of supplying all loads continuously. The failure of an APSE shall be enunciated in the Driver's cab and shall be recorded in the TMS and APSE. At least one dead battery start feature shall be incorporate in one train-set, which shall be located in the Driver's cab.

14.2.2 The APSE shall consist of but not limited to auxiliary power inverter (Si-IGBT or Hybrid-SiC Technology, Self-cooling/force ventilated), to supply all AC power, and a Low Voltage Power Supply (LVPS) to provide low voltage DC power, HSCB and Fuse to protect from over current.

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14.2.7 The output of the LVPS shall be routed to the low voltage distribution panel/cabinet inside the car. The negative return current from each subsystem shall run individually to the Engineer's reviewed insulated common point located in an enclosure under the car or inside of the car.

14.2.8 The entire Auxiliary Power Supply Equipment and controls shall be reviewed and commented by the Engineer.

14.2.9 If APS stops to operate by a serious failure, switch which can reset from the driver cab

inside the car. The negative return current from each subsystem shall run individually to the Engineer's reviewed insulated common point located in an enclosure under the car or inside of the car.

14.2.8 The entire Auxiliary Power Supply Equipment and controls shall be reviewed and commented by the Engineer.

14.2.9 If APS stops to operate by a serious failure, switch which can reset from the driver cab shall be installed.

14.3 Redundant system

14.3.1 ~~Two (2)~~ APSEs mounted on ~~train-set~~limited express train shall ~~perform~~ have a parallel synchronous operation. If one of two performing parallel synchronous stops by trouble, the other APSE shall perform normally. Then, the signal of VAC degraded mode of operation shall be transmitted to VAC of the affected area through TMS.

14.4 Maintenance Requirements

14.4.1 No component in the APSE and the ACU except for cover packing, power supply unit (AVR), gate IF, contacts of LB shall require removal or replacement for at least 12 years.

14.4.2 Any fault in the APSE or the ACU shall be logged and into the Fault Indication System of the TMS and ACU. What is needed of any fault shall be enunciated in the Driver's Cab. Logged fault into the TMS and ACU shall be stored and remain until certain number of faults. ACU shall have ordinary-speed and high-speed trace function. In high-speed trace function, logged fault related to the switching of element and behavior of instantaneous current and voltage etc. shall be required to be available for fault diagnostic analysis.

14.4.3 Means shall be provided to automatically discharge capacitors whose voltage might present a hazard to a maintenance worker opening any enclosure. Discharge time shall not be more than 5 minutes.

14.5 Circuit Breaker Panels and Isolating Switches

14.5.1 The following distribution panels shall be provided:

1) Low (100 Vdc) Voltage Circuit Breaker Panel;
2) 220/440 V_{AC} Circuit Breaker Panel;
3) All 220/440 V_{AC} circuit breakers shall be located in a separate enclosure, and shall individually protect the circuits;
4) Panel for Auxiliary Power Supply Equipment;
5) Spare Circuit Breakers for all panels and
6) All isolating switches and Circuit breakers necessary for vehicle intervention shall be placed inside the driver's cab for easy access and intervention.

14.5.2 All circuit breakers and switches necessary for vehicle revenue line fault intervention shall be located inside the drivers' cab. The final list of circuit breakers and switches shall be subject to review by the Engineer. All circuit breaker panels shall be reviewed and commented by the Engineer. ~~Attention shall be paid that arrangement of the panels are coordinated in consideration with operations in MCRP, NSCR and NSRP-S.~~

14.6 Emergency Power Supply

shall be reviewed by the Engineer.

14.1.8 The Contractor shall submit the required capacity calculation considering 10 cars train-sets in the future extension and reviewed by the Engineer.

14.1.9 The design of the auxiliary electrical system shall have sufficient capacity to provide backup power for normal operation of the emergency loads even in the event of lost overhead power. The design of the auxiliary electrical system and its capacity, including the backup power, shall be reviewed by the Engineer.

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14.2.2 The APSE shall consist of but not limited to auxiliary power inverter (Si-IGBT or Hybrid-SiC Technology, Self-cooling/force ventilated), to supply all AC power, and a Low Voltage Power Supply (LVPS) to provide low voltage DC power, HSCB and Fuse to protect from over current.

14.2.3 When designing the auxiliary power inverter, particular care shall be taken to account for the simultaneous starting of large auxiliary loads, such that rapid cycling is avoided (particularly the VAC compressor). The inverter shall use a control scheme that contains extensive self-diagnostic logic, and receptacles shall be placed in the vehicle interior and exterior to allow the connections to any necessary test equipment.

14.2.4 The chassis of APSE shall be with the use of aluminum alloys or other suitable materials which suitable for use on railways vehicles which are subsequently subjected to vibration and shock owing to the nature of railway operating environment.

14.2.5 The auxiliary power inverter output transformer shall be galvanically isolated, and the secondary windings shall incorporate a ground fault protection system. Upon detection of a ground fault, a fault message shall be transmitted to the TMS.

14.2.6 The LVPS shall provide the power to all system controls, including the Power Conversion Equipment, friction brakes (computer, brake control units, dump valves, etc.), VAC equipment, lighting, communication equipment, doors, radio, ATP, etc. The LVPS shall be solid-state and shall contain appropriate transient suppression and protective circuitry. The LVPS shall also incorporate appropriate fault and operation indicating lights and test switches. The failure of an LVPS shall be recorded in the TMS and APSE. Logged fault into the TMS and APSE shall be stored and remain until certain number of faults. APSE shall have ordinary-speed and high-speed trace function. In high-speed trace function, logged fault related to the switching of element and behavior of instantaneous current and voltage etc. shall be required to be available for fault diagnostic analysis.

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of responsibility shall be jointly agreed amongst the two Contractors, and a detailed procedure shall be developed prior to the introduction of any modifications.

~~17.8.13 The CP NS-03 Contractor shall provide the facility for the curve test.~~

17.9 Electro-Magnetic Compatibility (EMC) / Electro-Magnetic Interference (EMI) Interface

17.9.1 The CP NS-01 Contractor shall provide a list of frequencies and other electro-magnetic sensitivity requirements to the CP NS-03 Contractor to enable them to avoid such frequency bands in their design, and to provide devices to isolate the source of potential EMI emissions whether they are radiated, conducted, or induced wherever required. Conversely, the CP NS-01 Contractor shall ensure their equipment does not generate spurious or transient frequencies or harmonics, which may adversely affect rolling stock apparatus. Both Contractors shall work together to assure that all equipment shall work safely, reliably under electromagnetic and electrostatic interference conditions where there are traction voltages such as 1500 Vdc and any other high voltage electrical sources including power cables running along the track. The system shall be designed to operate under the worst-case interference conditions.

17.9.2 The CP NS-03 and CP NS-01 Contractor shall ensure that emissions and immunity levels of their respective equipment meet the requirements of IEC 62236 or equivalent standards.

17.9.3 The CP NS-03 Contractor shall ensure that the return current in the track at the specified frequencies, if any, does not exceed the values specified by the CP NS-01 Contractor.

17.9.4 The two Contractors shall also jointly develop a test plan detailing how the electromagnetic compatibility of the traction and signaling systems shall be verified. The two Contractors shall work together to assure that all electronic and electrical equipment on the Rolling Stock operates correctly without interfering with the signaling systems and vice versa.

17.9.5 The cable layout of the signaling systems in the cable ducts provided by the CP NS-03 Contractor shall be jointly agreed. The separation between signaling cables and power cables of 1500 Vdc, 440 Vac three-phase, 220 Vac single phase, 100 Vdc or any other similar higher voltage rating shall be in accordance with international practices.

17.10 Operational Modes:

17.10.1 The following operational train modes shall be adopted for the line:

1) Automatic Train Operation (ATO) Mode (for future use);
2) Automatic Train Protection (ATP) Mode;
3) On-Sight (OS) Mode;
4) Staff Responsible (SR) Mode; and
5) Isolation Mode.

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17.11 Automatic Train Operation (ATO) Mode

for review a Commissioning Plan Compendium, recording all testing carried out, functions and performance demonstrated, reports produced and reviewed by the Engineer. This shall include the Trial Operation as mentioned in ERG clause 12.2.4.

20.2.3 Testing Details

20.2.3.1 For any tests where the Engineer has indicated that they wish to witness, no testing shall be carried out against a test specification prior to its review by the Engineer.

20.2.3.2 The test specification shall include sample test certificates and the design values and also the tolerances shall be shown.

20.2.3.3 All materials and/or details represented by samples, which are found to be non-compliant, will be rejected.

20.2.3.4 The Contractor shall replace any material or detail destroyed in the process of testing.

20.3 Design Qualification Testing

20.3.1 As part of the design verification process, type tests shall be carried out to demonstrate that the design of the train consist, and its systems are in full compliance with the requirements specified in this ERT. The tests shall be completed at the Contractor's manufacturing facility unless otherwise specified or reviewed by the Engineer.

20.3.2 The Contractor shall perform an endurance test in accordance to the requirements of Sub-Clause 7.1 of this ERT on the proposed door design to demonstrate that the requirements specified therein are met.

20.3.3 The door system shall be endurance tested on a rig in suitable climatic conditions to demonstrate that the door system will allow the train consist to meet the requirements of this ERT. The rig shall test opening and closing of the door, obstruction detection and re-open of the door in a combination to simulate likely service operation and shall be submitted for review by the Engineer.

20.3.4 Design Qualification testing shall be performed of the complete propulsion, braking and Train Management System (TMS) systems configuration, using simulated loads on the traction motors. Combined propulsion system testing shall be in accordance with JIS E 5008 and JIS E 5011 or other equivalent standards like IEC 61287-1 and IEC 61377.

20.3.5 Design Qualification testing shall be performed on the complete auxiliary power system configuration, using simulated loads. Combined auxiliary power system testing shall be in accordance with JIS E 5008 or other equivalent standards like IEC 61287-1.

20.3.6 Design Qualification testing shall be performed for the TMS system to verify designed capacity of the systems, functional requirement and correct interfacing. The real interface hardware and software should be used where possible.

20.3.7 The braking system shall be tested to demonstrate its ability to satisfactorily interface with the Train Control and Signaling systems and provide performance as specified herein.

20.3.8 The CP NS-03 Contractor shall provide the facility for the bogie curve test.

~~20.3.7~~

~~20.3.8~~20.3.9 The parking brake shall be tested to demonstrate its ability to hold a consist on the specified gradient. The test shall record the actual force required to overcome the parking

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20.3.8 The CP NS-03 Contractor shall provide the facility for the bogie curve test.

20.3.9 The parking brake shall be tested to demonstrate its ability to hold a consist on the specified gradient. The test shall record the actual force required to overcome the parking brake in a failure recovery situation on both level track and a 3.5% gradient. This shall be carried out with a number of parking brakes (20%) isolated.

20.3.10 Before transporting the Rolling Stock to Manila, the Contractor shall perform a test to

24 Spare Parts and Special Tools

24.1 General

24.1.1 The Contractor shall provide spare parts, special tools as specified in both the General Requirements as well as this clause.

24.1.2 As part of the performance acceptance criteria, the Contractor shall deliver the spares and consumables, special tools and diagnose test equipment to the Site.

24.2 Spare Parts

24.2.1 The Contractor shall provide a list of capital spares and consumables (spares and consumables) and supply for the Defects Notification Period (DNP).

24.2.2 The Employer may order additional spares required for the following 15 years from the recommended spare parts and consumables list as provided by the Contractor.

24.2.3 The Contractor shall provide a complete listing of spares and consumables to be supplied, including the following information:

a. Contractor part number;
b. Original equipment manufacturer part number; and
c. Part description.
d. Price
e. Primary Vendor name/contact/address
f. Secondary Vendor name/ contact/ address

24.2.4 The Contractor shall submit the final list of capital spare during the design stage.

24.2.5 The spare part supplied during DNP shall include at least the below list of spare parts as minimum. Unless otherwise stated, t~~T~~he quantity shall be based on one (1) trainset basis. Final list shall be confirmed during design stage.

No	Description
1	Wheel and Axle Assembly for Motor;
2	Wheel and Axle Assembly for Trailer Bogie;
3	Wheel Assembly;
4	Primary Suspension;
5	Secondary Suspension;
6	~~Tread~~ Brake Caliper Assembles;
7	Gearbox Assembly;
8	Flexible Coupling Assembly (link for Gear box and Traction Motor);
9	Traction Motor Assembly;
10	Current Return Assembly;
11	Air Compressor Assembly;
12	Air Drier for Compressed Air;
13	Pantograph Assembly;
14	Arrestor Assembly
15	Air Conditioning Unit Assembly;
16	ACU Compressor Assembly;
17	~~Unit~~ Brake Control Unit Assemblies;
18	Evaporator Blower Assembly;

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4	Primary Suspension;
5	Secondary Suspension;
6	Brake Caliper Assembles;
7	Gearbox Assembly;
8	Flexible Coupling Assembly (link for Gear box and Traction Motor);
9	Traction Motor Assembly;
10	Current Return Assembly;
11	Air Compressor Assembly;
12	Air Drier for Compressed Air;
13	Pantograph Assembly;
14	Arrestor Assembly
15	Air Conditioning Unit Assembly;
16	ACU Compressor Assembly;
17	Brake Control Unit Assemblies;
18	Evaporator Blower Assembly;

7) Points to be noted in maintaining the systems, and

8) Safety precautions needed when maintaining the system/sub-system.

~~25.4.7 Training shall include re-railing procedure and actual demonstration involving the new vehicle.~~

25.5 Engineering Staff Training

25.5.1 The Contractor shall carry out training on specific systems for engineering staff of the Employer/Concessionaire, in order to provide them with the basis for engineering management tasks.

25.6 Proficiency Verification

25.6.1 The Contractor shall devise a system and standards in assessing the proficiency of the trainees. The system and standards shall be subject to review by the Engineer. After verification by the training organization, each trainee will receive an interview by the Rolling Stock Management whereby he will be required to show competence in the elements trained

25.7 Trainee Population

25.7.1 The number of staff to be trained shall not be less than as follows:

1) Operation Staff – 12

2) Maintenance Staff

   a) • Supervisors – 8

   b) • Mechanical Technicians – 10

   c) • Electrical Technicians – 10

   d) • Electronic Technicians – 10

3) Engineering Staff – 4

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minutes, and the fleet maintainability of capital components a Corrective Mean Time To Repair (CMTTR) of 4 hours.

8.1.9 The Contractor shall provide sufficient documented information for review by the Engineer. It is expected that the design demonstration of the Rolling Stock performance shall be achieved through supplier-based material self-certification, including cross-references to proven and accredited in-service performance of Rolling Stock equipment supplied in a similar railway application.

8.1.10 With regard to Safety, it is expected that certification shall be achieved through supplier-based information via application of cross references to previously certified acceptances from a reputable body (e.g., train operators, national railways authorities, independent accredited safety bodies, etc.) of similarly supplied Rolling Stock equipment, with a product-generic safety case application to be made based on existing safety certification.

8.1.11 The Employer shall conduct compliance audits during design, development, manufacture and testing and commissioning phases to ensure that the Contractor has met all relevant System Assurance requirements. The Engineer shall give 7 days' notice to the Contractor about the audit arrangement. The Contractor shall provide all necessary assistance to enable the Employer or his representative complete the audit.

~~8.1.11~~8.1.12 The Contractor shall propose design, implementation techniques and measures, depending on the SIL of the function in line with the principles of EN50128 and EN50129 or other equivalent standard subject to the given notice of no objection by the Engineer.

8.2 Performance Assurance Plan (PAP)

8.2.1 Within the SAMP, the Contractor shall submit a Performance Assurance Plan (PAP) or RAM Assurance Plan as per EN 50126 or IEC 62278 or any other equivalent international standard for the Rolling Stock as an assurance of reliability, for operational service. Reliability and availability will be assessed against specific targets laid out in this tender. In order to provide confidence that the final operating system shall achieve the requirements of the performance measures, RAM analyses and assessments shall be undertaken at appropriate stages of the project by the Contractor.~~to comply with the Employers Requirement (functional, performance and safety Requirements) and submitted for review by the Employer/Engineer.~~ The PAP shall describe the activities that the Contractor proposes to carry out during the life cycle of the design, implementation and operation of the Rolling Stock, to ensure that design solution will ultimately provide a level of assurance that the project availability requirements have been achieved.~~and shall demonstrate compliance with the Employer's Requirements, achievement of a TOC for each train set, and a Performance Certificate for the total fleet (7 trainsets).~~

8.2.2 ~~The Contractor shall implement~~ Since availability is a function of reliability and maintainability, the Contractor shall require to carry out reliability and maintainability analysis to show the system availability targets will be met and have been achieved by the end of the Demonstration phase.~~a formal Maintainability Plan for Rolling stock any other applicable system to comply with the Technical Requirements (ERT).~~

8.3 Performance (RAM) Requirements

8.3.1 The Contractor shall submit the Performance or RAM (Reliability, Availability and Maintainability) Target Apportionment Report in the preliminary design stage.

8.3.2 The Contractor shall conduct a Preliminary RAM Analysis which shall give an initial indication of any RAM problems which may arise which might affect the performance of the rolling stock.

8.1.9 The Contractor shall provide sufficient documented information for review by the Engineer. It is expected that the design demonstration of the Rolling Stock performance shall be achieved through supplier-based material self-certification, including cross-references to proven and accredited in-service performance of Rolling Stock equipment supplied in a similar railway application.

8.1.10 With regard to Safety, it is expected that certification shall be achieved through supplier-based information via application of cross references to previously certified acceptances from a reputable body (e.g., train operators, national railways authorities, independent accredited safety bodies, etc.) of similarly supplied Rolling Stock equipment, with a product-generic safety case application to be made based on existing safety certification.

8.1.11 The Employer shall conduct compliance audits during design, development, manufacture and testing and commissioning phases to ensure that the Contractor has met all relevant System Assurance requirements. The Engineer shall give 7 days' notice to the Contractor about the audit arrangement. The Contractor shall provide all necessary assistance to enable the Employer or his representative complete the audit.

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8.2.2 Since availability is a function of reliability and maintainability, the Contractor shall require to carry out reliability and maintainability analysis to show the system availability targets will be met and have been achieved by the end of the Demonstration phase.

8.3 Performance (RAM) Requirements

8.3.1 The Contractor shall submit the Performance or RAM (Reliability, Availability and Maintainability) Target Apportionment Report in the preliminary design stage.

8.3.2 The Contractor shall conduct a Preliminary RAM Analysis which shall give an initial indication of any RAM problems which may arise which might affect the performance of the rolling stock.

8.3.3 The Contractor shall provide RAM Management Plan (Can be part of Systems Assurance Management plan), RAM Analysis Report, RAM Demonstration Test, Maintainability Demonstration Test Plan, FMECA Analysis Report, RAM Demonstration Report and DRACAS report as necessary in the relevant stages of the project.

8.3.4 RAM Management Plan shall include the strategy for the management of RAM and safety issues and define the specific tasks to be performed throughout all the lifecycle of the project.

8.1 General

8.1.1 System Assurance Management is applicable for all stages of the Rolling Stock development, including design, manufacture, testing, commissioning, systems integration, trial operations, and in-service operations.

8.1.2 The Contractor shall submit a comprehensive System Assurance Management Plan (SAMP) which contains all requirements within this ERG Section 8 of this document, for the Engineer's review. The SAMP shall include, but not limited to the Contractor's methodology to plan, manage and control the system assurance process, organization and roles/responsibilities of the key personnel for system assurance, tasks, program and procedures for system assurance, and an internal audit program.

8.1.3 The System Assurance activities~~Plan~~ shall cover Reliability, Availability, Maintainability and Safety, Electromagnetic Compatibility (EMC), Fire Safety strategy and System Engineering. shall cover the System Assurance Management, System Safety (including the Electromagnetic Compatibility (EMC), Fire Safety strategy), Software Management and Control, Reliability, Availability, Maintainability (RAM) and Requirement Management. The SAP shall include (but not be limited to) the following details: Project Organization; Roles and Responsibilities; Assurance processes and outputs; System Safety processes and outputs; RAM processes and outputs; Requirements management processes and outputs; Assurance Reporting; and Timescales for Assurance Activities.

8.1.4 The System Assurance Management Plan shall comprise a programme showing in detail the timing of each activity and the anticipated dates for submission of system assurance documentation. The programme will break down the planned activities into discrete stages of work as a minimum design, manufacturing, installation, testing and commissioning and RAM demonstrations.

8.1.5 ~~System Assurance~~The Plan shall clearly identify the reviews to be performed at the end of each stage of the programme. The Contractor shall convene formal System Assurance Review (SAR) meetings to review all SA activities and to ensure operational hazards are comprehensively identified within the scope of the Contract. The SAR meetings shall be held quarterly, or when there is any key system change, and meeting records shall be submitted by the Contractor to the Employer. The Employer and the Engineers may participate in the SAR .System Assurance Report shall be submitted at the end of each stage of the programme which covered all the subjects above. ~~The Subsystem Assurance Plans will be consistent in approach with the System Assurance Plan~~. The Contractor's subcontractor or supplier shall provide the SAMP which will be in consistent in approach with the Contractor SAMP.

8.1.6 The SAMP shall be certified by the Contractor's internal department or by a third-party independent engineer from the design and manufacturing section. The SAMP shall be specifically developed for this Contract. ~~The SAMP shall address the Performance (Reliability, Availability, Maintainability) and Safety of the Rolling Stock.~~

8.1.7 A Taking Over Certificate (TOC) will be issued for each trainset. In order to obtain a TOC for the Rolling Stock from the Employer/Engineer, it is required that each trainset achieves 1,500 km of Fault-Free Running (FFR) during the integrated testing and commissioning.

8.1.8 A Performance Certificate will be issued by the Engineer for the total performance of the fleet. This Performance Certificate is required to be achieved by the end of the Defect Notification Period (DNP). Prerequisites to obtain the Performance Certificate includes: each trainset shall achieve 10,000 km or 2 months of FFR, the fleet (7 trainsets) shall achieve a Mean Distance Between Failures (MDBF) of 50,000 km causing a delay greater than 5 minutes, a fleet in-service Operational Mean Time To Restore (OMTTR) of 15

minutes, and the fleet maintainability of capital components a Corrective Mean Time To Repair (CMTTR) of 4 hours.

8.1.9 The Contractor shall provide sufficient documented information for review by the Engineer. It is expected that the design demonstration of the Rolling Stock performance shall be achieved through supplier-based material self-certification, including cross-references to proven and accredited in-service performance of Rolling Stock equipment supplied in a similar railway application.

8.1.10 With regard to Safety, it is expected that certification shall be achieved through supplier-based information via application of cross references to previously certified acceptances from a reputable body (e.g., train operators, national railways authorities, independent accredited safety bodies, etc.) of similarly supplied Rolling Stock equipment, with a product-generic safety case application to be made based on existing safety certification.

8.1.11 The Employer shall conduct compliance audits during design, development, manufacture and testing and commissioning phases to ensure that the Contractor has met all relevant System Assurance requirements. The Engineer shall give 7 days' notice to the Contractor about the audit arrangement. The Contractor shall provide all necessary assistance to enable the Employer or his representative complete the audit.

~~8.1.11~~8.1.12 The Contractor shall propose design, implementation techniques and measures, depending on the SIL of the function in line with the principles of EN50128 and EN50129 or other equivalent standard subject to the given notice of no objection by the Engineer.

8.2 Performance Assurance Plan (PAP)

8.2.1 Within the SAMP, the Contractor shall submit a Performance Assurance Plan (PAP) or RAM Assurance Plan as per EN 50126 or IEC 62278 or any other equivalent international standard for the Rolling Stock as an assurance of reliability, for operational service. Reliability and availability will be assessed against specific targets laid out in this tender. In order to provide confidence that the final operating system shall achieve the requirements of the performance measures, RAM analyses and assessments shall be undertaken at appropriate stages of the project by the Contractor.~~to comply with the Employers Requirement (functional, performance and safety Requirements) and submitted for review by the Employer/Engineer.~~ The PAP shall describe the activities that the Contractor proposes to carry out during the life cycle of the design, implementation and operation of the Rolling Stock, to ensure that design solution will ultimately provide a level of assurance that the project availability requirements have been achieved.~~and shall demonstrate compliance with the Employer's Requirements, achievement of a TOC for each train set, and a Performance Certificate for the total fleet (7 trainsets).~~

8.2.2 ~~The Contractor shall implement~~ Since availability is a function of reliability and maintainability, the Contractor shall require to carry out reliability and maintainability analysis to show the system availability targets will be met and have been achieved by the end of the Demonstration phase.~~a formal Maintainability Plan for Rolling stock any other applicable system to comply with the Technical Requirements (ERT).~~

8.3 Performance (RAM) Requirements

8.3.1 The Contractor shall submit the Performance or RAM (Reliability, Availability and Maintainability) Target Apportionment Report in the preliminary design stage.

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8.3.4 RAM Management Plan shall include the strategy for the management of RAM and safety issues and define the specific tasks to be performed throughout all the lifecycle of the project.

8.3.5 The Contractor shall establish and include procedure of Fleet Defect (Pattern Defect) of the rolling stock which shall not limited to issuance of a failure analysis report (FAR), the engineering design change, restart of RAM demonstration of the effected components and extended of warranty of the affected components.

~~8.3.3~~8.3.6 In case of a safety critical failure, the contractor shall establish and include the procedure which shall not limited to issuance of a failure analysis report (FAR), shutdown the system operation, the containment plan and restriction special instruction as corrective action, the engineering design change, restart of RAM demonstration of the effected components and extended of warranty of the affected components.

~~8.3.4~~8.3.7 The Contractor shall establish a Data Reporting and Corrective Action System (DRACAS) to monitor the safety and RAM performance of the equipment, from the design, through testing and commissioning and into operation. The system shall be used to monitor the performance of components and to identify patterns of failures so that corrective action can be taken to improve both current and future systems.

~~8.3.5~~8.3.8 The reliability of the trains shall be measured based on the number of train service disruption incidents, hereafter referred to as incidents, which are caused by train failures during operation. An incident is defined as any one of the following events which are caused by a train failure:

1) Train removed from Service;
2) Delay to Train Service (more than 5 minutes);
3) Failure to be Dispatched.

8.4 (Not Used)

8.5 Performance Acceptance Criteria (PAC)

8.5.1 All RAM calculations shall use an annual operation of 19 hours a day, 7 days a week, with engineering downtime of 5 hours a day.

8.5.2 Each trainset shall achieve:

1) ~~Trail~~ Trial Operation (selected trainset) – No major faults.
2) **In-service Operations -** 10,000 km or two (2) months of continuous in-service operational FFR.

8.5.3 The train fleet (7 trainsets) as a whole shall achieve:

1) **MDBF –** In service operational faults, MDBF no less than 50,000 km causing a delay greater than 5 minutes.
2) **OMTTR** – Operational Mean Time To Restore (OMTTR) capital components; the trainsets shall be restored to operational order in an OMTTR of 15 minutes.
3) **CMTTR –** Corrective Mean Time To Repair (CMTTR) capital components shall

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8.1.11 The Employer shall conduct compliance audits during design, development, manufacture and testing and commissioning phases to ensure that the Contractor has met all relevant System Assurance requirements. The Engineer shall give 7 days' notice to the Contractor about the audit arrangement. The Contractor shall provide all necessary assistance to enable the Employer or his representative complete the audit.

8.1.12 The Contractor shall propose design, implementation techniques and measures, depending on the SIL of the function in line with the principles of EN50128 and EN50129 or other equivalent standard subject to the given notice of no objection by the Engineer.

8.2 Performance Assurance Plan (PAP)

8.2.1 Within the SAMP, the Contractor shall submit a Performance Assurance Plan (PAP) or RAM Assurance Plan as per EN 50126 or IEC 62278 or any other equivalent international standard for the Rolling Stock as an assurance of reliability, for operational service. Reliability and availability will be assessed against specific targets laid out in this tender. In order to provide confidence that the final operating system shall achieve the requirements of the performance measures, RAM analyses and assessments shall be undertaken at appropriate stages of the project by the Contractor. The PAP shall describe the activities that the Contractor proposes to carry out during the life cycle of the design, implementation and operation of the Rolling Stock, to ensure that design solution will ultimately provide a level of assurance that the project availability requirements have been achieved.

8.2.2 Since availability is a function of reliability and maintainability, the Contractor shall require to carry out reliability and maintainability analysis to show the system availability targets will be met and have been achieved by the end of the Demonstration phase.

8.3 Performance (RAM) Requirements

8.3.1 The Contractor shall submit the Performance or RAM (Reliability, Availability and Maintainability) Target Apportionment Report in the preliminary design stage.

8.3.2 The Contractor shall conduct a Preliminary RAM Analysis which shall give an initial indication of any RAM problems which may arise which might affect the performance of the rolling stock.

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8.3.7 The Contractor shall establish a Data Reporting and Corrective Action System (DRACAS) to monitor the safety and RAM performance of the equipment, from the design, through testing and commissioning and into operation. The system shall be used to monitor the performance of components and to identify patterns of failures so that corrective action can be taken to improve both current and future systems.

8.3.8 The reliability of the trains shall be measured based on the number of train service disruption incidents, hereafter referred to as incidents, which are caused by train failures during operation. An incident is defined as any one of the following events which are caused by a train failure:

1) Train removed from Service;
2) Delay to Train Service (more than 5 minutes);
3) Failure to be Dispatched.

8.4 (Not Used)

8.5 Performance Acceptance Criteria (PAC)

8.5.1 All RAM calculations shall use an annual operation of 19 hours a day, 7 days a week, with engineering downtime of 5 hours a day.

8.5.2 Each trainset shall achieve:

1) Trial Operation (selected trainset) – No major faults.
2) **In-service Operations -** 10,000 km or two (2) months of continuous in-service operational FFR.

8.5.3 The train fleet (7 trainsets) as a whole shall achieve:

1) **MDBF** – In service operational faults, MDBF no less than 50,000 km causing a delay greater than 5 minutes.
2) **OMTTR** – Operational Mean Time To Restore (OMTTR) capital components; the trainsets shall be restored to operational order in an OMTTR of 15 minutes.
3) **CMTTR –** Corrective Mean Time To Repair (CMTTR) capital components shall not be greater than 4 hours.

8.5.4 Where appropriate, the Contractor shall also specify RAM (Reliability, Availability and Maintainability) requirements for the design, operation and maintenance of subsystems where the failure mode, effects and criticality analysis (FMECA) identify failure modes that have a maintenance, operations or safety impact, using the risk assessment methodology.

8.5.5 The Contractor shall commence the use of the Data reporting analysis and corrective action system (DRACAS) prior to any factory or site acceptance tests and report to the

not be greater than 4 hours.

8.5.4 Where appropriate, the Contractor shall also specify RAM (Reliability, Availability and Maintainability) requirements for the design, operation and maintenance of subsystems where the failure mode, effects and criticality analysis (FMECA) identify failure modes that have a maintenance, operations or safety impact, using the risk assessment methodology.

8.5.5 The Contractor shall commence the use of the Data reporting analysis and corrective action system (DRACAS) prior to any factory or site acceptance tests and report to the Employer/Engineer on a regular basis.

8.5.6 (Not Used)

8.6 Performance Reports

8.6.1 The Contractor shall provide Performance Reports to support the applications for Rolling Stock TOC for each trainset and the Performance Certificate for the fleet (7 trainsets).

8.6.2 The Rolling Stock TOC Performance report shall be issued for each trainset prior to operational acceptance and shall provide:

1) Technical design justification of performance;

2) Cross reference to Rolling Stock performance in a similar application;

3) The design prediction at LRU (Line replaceable unit) level (MDBF, OMTTR and CMTTR) of all capital components;

4) Failure mode, effect, & criticality analysis (FMECA) and Fault Tree Analysis (FTA), FTA shall only applicable to new or critical subsystem equipment or when failure consequences is not solved.

~~4)~~

5) Reliability Critical item list which might impact the operations of the train or train service,

6) Manufacturing Completion Certificate for each train,

7) Design Qualification Testing Completion Certificate,

8) Factory Acceptance Tests Completion Certificate,

9) Train Delivery to site completion Certificate,

10) Design Safety Case of Safety Report,

~~9)~~

~~10)~~11) Engineer Notice of No Objection of submitted list of As-built Drawing,

~~11)~~12) Engineer Notice of No Objection of c~~C~~ompletion of Training program,

~~12)~~13) On-site Testing and Commissioning Completion Certificate for each train, and

~~13)~~14) Train Operation Completion Certificate for each train 1500 km (FFR)

8.6.3 The Rolling Stock Performance report shall be issued progressively on a monthly basis, shall be finalized at the end of DNP, and shall provide:

1) In-service FFR operational performance of individual trainsets as per clause 8.5~~3.3~~;

2) In-service operational performance of the fleet (7 trainsets) MDBF as per clause 8.5~~3.3~~;

Employer/Engineer on a regular basis.

8.5.6 (Not Used)

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8.6.1 The Contractor shall provide Performance Reports to support the applications for Rolling Stock TOC for each trainset and the Performance Certificate for the fleet (7 trainsets).

8.6.2 The Rolling Stock TOC Performance report shall be issued for each trainset prior to operational acceptance and shall provide:

1) Technical design justification of performance;
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5) Reliability Critical item list which might impact the operations of the train or train service,
6) Manufacturing Completion Certificate for each train,
7) Design Qualification Testing Completion Certificate,
8) Factory Acceptance Tests Completion Certificate,
9) Train Delivery to site completion Certificate,
10) Design Safety Case of Safety Report,
11) Engineer Notice of No Objection of submitted list of As-built Drawing,
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8.6.3 The Rolling Stock Performance report shall be issued progressively on a monthly basis, shall be finalized at the end of DNP, and shall provide:

1) In-service FFR operational performance of individual trainsets as per clause 8.5;
2) In-service operational performance of the fleet (7 trainsets) MDBF as per clause 8.5;
3) The in-service OMTTR and CMTTR of all capital components as per clause 8.5,
4) Completion of Defect Remedial,
5) Completion of Open Item,
6) Completion of Modification, and
7) Completion of Spare Part, Special Tools and Test Equipment delivery, and
8) DRACAS report

8.7 Performance Certificate

8.7.1 During the in-service Defects Notification Period (DNP), the fleet (all 7 trainsets) in total shall demonstrate successful achievement of the Performance Acceptance Criteria (PAC)

3) The in-service OMTTR and CMTTR of all capital components as per clause 8.5~~3.3~~,

4) Completion of Defect Remedial,

5) Completion of Open Item,

6) Completion of Modification, and

7) Completion of Spare Part, Special Tools and Test Equipment delivery, and

8) DRACAS report

8.7 Performance Certificate

8.7.1 During the in-service Defects Notification Period (DNP), the fleet (all 7 trainsets) in total shall demonstrate successful achievement of the Performance Acceptance Criteria (PAC) which will be a prerequisite of the application for a Performance Certificate to be issued by the Engineer.

8.7.2 Failure to meet the PAC within the DNP shall mean that the DNP shall be extended until such time as the PAC of the total fleet has been met. All cost associated with the extension of the DNP shall be borne by the Contractor.

8.7.3 The DNP shall be up to a limit of 4 years from the date of commencement of the first train in-service operation.

8.8 Safety Assurance

8.8.1 Safety

8.8.1.1 Safety is defined as freedom from those conditions that can cause death, injury, occupational illness, or damage to or loss of equipment or property. All circumstances susceptible to cause injuries or fatalities of passengers, operation staff, and maintenance staff are considered as risks, and by extension, includes all events leading to a partial or total destruction of costly equipment. The objective of safety is expressed by the capability of the Rolling Stock to keep the physical integrity of the asset and to preserve the safety during railway operations and maintenance for passengers, staff and persons in general. The safety assurance program aims to reduce to a tolerable level the probability of occurrence of catastrophic or critical events causing damage to assets or harm to any person. The Contractor shall follow appropriate risk reduction principle such as ALARP (As Low as Reasonably Possible) to demonstrate the risk acceptance to the Employer.

8.8.1.2 The Contractor shall bear the duty of safety in design for the assurance of safety for the life cycle of operations for MCRP and NSRP-S. The Rolling Stock shall fulfil the safety requirements of all General Requirements and Technical Requirements and shall demonstrate that the train is fit for purpose to be operated and maintained in a safe manner for these projects.

8.8.2 System Safety ~~Assurance~~ Management Plan (S~~A~~MP)

8.8.2.1 Within the SAMP, the Contractor shall provide a Safety ~~Assurance~~ Management Plan (SM~~A~~P) for review by the Engineer however the document shall detail the specific safety related activities planned to be carried out by the Contractor to ensure the design solution will ultimately provide a level of assurance that the project safety requirements have been achieved.. The SM~~A~~P shall cover the design, manufacture, testing, commissioning and integrated testing phases, and safety management for in-service passenger operations. The Plan shall further identify how the magnitude and seriousness of events or malfunctions which could result in harm to passengers or staff and damage to equipment or property will be minimized.

8.8.2.2 System Safety ~~Assurance~~ Management Plan shall detail, but not limited to, the following:

1) Organization of the Safety team
2) Management of Safety-related interfaces with other contractors.
3) Provisions and procedures for providing feedback to and interacting with other disciplines in the Contractor's team, e.g. design, manufacturing, testing and commissioning and maintenance etc.
4) Identified Safety requirements (including interfaces).
5) Safety methods to be used for the safety analysis.
6) Management of subcontractors' Safety requirements.
7) Safety related software management
8) Quality management
9) Configuration management
10) Verification and validation of assessments, including data.
11) Validation of Safety requirements during manufacture, installation, commissioning and maintenance.
12) Audits and Review activities.
13) Record keeping of Safety assessments/analysis.
14) Hazard Log Management.
15) List of deliverables, including interim items listed within this document.
16) High level schedule for deliverables.

8.8.3 Safety Requirements

8.8.3.1 The Contractor shall submit the Preliminary Hazard Analysis Report in early design stage.

8.8.3.2 The Interface Hazard Analysis (IHA), System Hazard Analysis (SHA), Operating & Support Hazard Analysis (OSHA) shall be conducted upon completion of the Preliminary Hazard Analysis.

8.8.3.3 Hazard log management shall be performed to ensure all the hazards are at an acceptable risk limits with suitable mitigation control measures.

8.8.3.4 Safety Assessment for the Safety functions to be performed, for example:

No.	Subsystem	Function
1	Propulsion	Speed controls including ATP/Brake interface
2	Brake	Emergency Brake application
3	Passenger doors	Emergency door release
4	HVAC	Smoke / Heat Detections
5	Driver Machine Interface	Manual coupling / uncoupling /Train Complete Interlocking
6	Train Management System	On-board control and monitoring functions

8.8.3.5 The Contractors shall prepare a Safety Critical Item List of equipment and LRUs classified by their impact on safety for Employer review.

which will be a prerequisite of the application for a Performance Certificate to be issued by the Engineer.

8.7.2 Failure to meet the PAC within the DNP shall mean that the DNP shall be extended until such time as the PAC of the total fleet has been met. All cost associated with the extension of the DNP shall be borne by the Contractor.

8.7.3 The DNP shall be up to a limit of 4 years from the date of commencement of the first train in-service operation.

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8.8.2 System Safety Management Plan (SMP)

8.8.2.1 Within the SAMP, the Contractor shall provide a Safety Management Plan (SMP) for review by the Engineer however the document shall detail the specific safety related activities planned to be carried out by the Contractor to ensure the design solution will ultimately provide a level of assurance that the project safety requirements have been achieved.. The SMP shall cover the design, manufacture, testing, commissioning and integrated testing phases, and safety management for in-service passenger operations. The Plan shall further identify how the magnitude and seriousness of events or malfunctions which could result in harm to passengers or staff and damage to equipment or property will be minimized.

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3) Provisions and procedures for providing feedback to and interacting with other disciplines in the Contractor's team, e.g. design, manufacturing, testing and commissioning and maintenance etc.
4) Identified Safety requirements (including interfaces).
5) Safety methods to be used for the safety analysis.
6) Management of subcontractors' Safety requirements.

~~8.8.3.6 The Contractor shall submit the Failure Modes, Effects and Criticality Analysis (FMECA) Report in design stage and subsequent stages.~~

~~8.8.3.7~~8.8.3.6 In addition to the Hazard Log, the Contractor shall also set up and maintain a Register of Train Failures to document all scenarios which will result in a train failure. The causes, consequential effects and impact on train service shall be recorded for each entry in the Register.

~~8.8.3.8~~8.8.3.7 The Contractor shall provide Quantitative Risk Assessment for the "top events" related to Hazard~~Safety~~; for example:

1) Train collision on main line
2) Train derailment on main line
3) Fire in Train
4) Smouldering / Smoke in train
5) Train separation on main line
6) Undemanded passenger door opening on main line

~~8.8.3.9~~8.8.3.8 The Contractor shall provide Safety Verification evidences to demonstrate that safety functions / features which are an integral part of the design shall work as intended. The process shall be covered by type test and commissioning tests on items of equipment critical to safety.

~~8.8.3.10~~8.8.3.9 Design Safety Case and Final Safety Case or Safety repot for CP NS-03 Rolling Stock to be submitted for ISA review and Employer's Notice of No Objection to get a Taking Over Certificate (TOC) from the Employer.

8.8.4 Safety Report

8.8.4.1 The Contractor shall carry out Safety Assurance and provide Safety Reports to the Engineer to support the Rolling Stock safety application, in coordination with the Operator, to gain a TOC from the Engineer, and a final in-service safety report to support the Performance Certificate application.

8.8.4.2 The Contractor shall provide the following, but not limited to:

1) The Hazard Analysis report shall evaluate and ensure that all the hazards are identified and satisfactorily resolved to an acceptable level.
2) ~~Safety assessment report demonstrating~~Design Safety Requirement demonstrating the s~~S~~afety requirements are in compliant with Technical Requirements (ERT)
3) The Fire Safety Analysis report shall evaluate and ensure inter alia that the fire loadings of material proposed to be used, and the fire withstand ratings etc. are as per the requirements specified in the Employer's Requirements – Technical Requirements (ERT).
4) Design Safety Case ~~and Final Safety Case~~ or Safety report to be submitted for Employer's given statement of No Objection.

8.8.4.3 The Rolling Stock Design Safety report "Design Safety case" shall provide:

1) Technical Justification for Rolling Stock safety; and
2) Cross reference to a generic Rolling Stock safety application of similar product provided.
~~2)~~3) Statement on the safety of the design, to be made following the conclusion of each design phase. It shall summaries the findings of all the safety management activities

and shall be supported by the results of safety and other assessments which directly or indirectly support any claims made for the safe design of the system.

8.8.4.4 The Contractor shall submit the System Safety Demonstration Plan and Report. System Safety Demonstration activities and methods shall comply with IEC 61508 or other equivalent standard subject to the given notice of no objection by the Engineer.

8.8.4.5 Where software is involved, demonstration of the Software SIL (SIL) shall be performed in accordance with EN 50128 or other equivalent standard subject to the given of notice of no objection by the Engineer as per clause 7.10.2.1.

~~8.8.4.4~~8.8.4.6 Subsequent to the implementation of the recommendations mentioned in the Design Safety Case or Safety Report and the results of the various testing activities, the Design Safety Case or Safety Report shall be updated at the end of the Testing and Commissioning phase and submitted to the Engineer for review. The Design Safety Case or Safety Report shall be provided ~~Rolling Stock Operational Readiness Safety report "Final Safety case" provided~~ for each trainset at their TOC and shall provide:

1) The Safety application for in-service operations; and

2) The Safety Management System to be applied for in-service operations.

3) Identify modes of operation that are critical to the safe operation of the system, including emergency modes, maintenance and day-to-day operations. The final report shall be a statement on the safety of the system to substantiate all claims made against safety made within the design phase, with particular recourse to testing of the safety function of any part of the system and degraded safety-mode testing (i.e. to test where safe system operation is still possible, despite system failures).

8.8.4.7 Safety Monitoring during DNP:

1) The Contractor shall specifically track down failures or incidents which have or may have an impact on safety as per clause 8.3.6;

2) The monitoring report shall be included in the DRACAS report and shall be issued progressively on a monthly basis and finalized at the end of DNP. The report shall provide:

i) Safety Performance;

ii) Safety recommendation; and

iii) As per clause 8.3.6

~~2)~~

~~8.8.4.5 The Rolling Stock In-service Final Operational Safety reports shall be issued progressively on a monthly basis and finalized at the end of DNP; they shall provide:~~

~~1) Safety performance; and~~

~~2) Safety recommendations.~~

8.9 Independent Assessment

8.9.1 The Employer may appoint independent engineers and/or Independent Safety Assessors (ISAs) to assess on compliance with contract requirements on System Assurance. The Contractor, subcontractors and suppliers shall provide assistance to the appointed engineers and assessors, as required.

8.9.2 The independent assessor may undertake the following:

1) Assess on compliance with contract requirements on System Assurance;

~~1~~2) Safety audits;

~~2) Design reviews;~~

~~3) Witnessing of testing activities;~~

~~4~~3) Review of the safety and quality organizational activities;

~~5~~4) Review of the safety processes;

~~6~~5) Assessment of safety applications; and

~~7~~6) Provision of safety recommendations to the Employer.

9 CONTRACT PROCEDURES

9.1 Management of the Contract

9.1.1 On or before the commencement of the Works, the Contractor shall prepare and submit for review by the Employer/Engineer, details supplemented by diagrams as necessary, of the organization which he proposes to adopt for the management of the Contract. The details shall cover all aspects of the Contract and the function, responsibility and authority of each person represented shall be defined.

9.1.2 Prior to their commencing work on the Contract, the Contractor shall submit for review by the Employer/Engineer, names, qualifications and experience of all the key personnel in their organization.

9.1.3 Any changes or additions either to the organization or to key personnel shall be subject to review by the Employer/Engineer.

9.2 (Not used)

9.3 Design Submission and Review Procedure

9.3.1 The Contractor shall transmit all submissions to the Employer/Engineer as required under the Contract and shall establish and implement a comprehensive Digital Electronic Information Management System at their own cost as given Notice of No Objection by the Employer/Engineer to suit the Project requirements for the transmittal of formal correspondence, documents, drawings and information and ensure efficient information management on the Project including the tracking of Progress with user friendly Monitoring, Tracker Modules, Dash boards, Triggers and reminders throughout the project life from Design stage to Testing & Commissioning and trial run.

9.4 Submission of Information – General

9.4.1 The Contractor shall submit to the Employer/Engineer, designs, general arrangement and detail drawings, specifications, reports and other technical literature, method statements, calculations, schedules, programs, samples, patterns and models for review in accordance with the requirements of the Contractor's final time schedule.

9.4.2 The Contractor shall be responsible for the completeness of all information submitted.

9.4.3 The Contractor shall submit his designs for the works to the Engineer for review. The design shall be submitted in the following stages as stated in Sub-Clause 224.2 of the Technical Requirements:

7) Safety related software management
8) Quality management
9) Configuration management
10) Verification and validation of assessments, including data.
11) Validation of Safety requirements during manufacture, installation, commissioning and maintenance.
12) Audits and Review activities.
13) Record keeping of Safety assessments/analysis.
14) Hazard Log Management.
15) List of deliverables, including interim items listed within this document.
16) High level schedule for deliverables.

8.8.3 Safety Requirements

8.8.3.1 The Contractor shall submit the Preliminary Hazard Analysis Report in early design stage.

8.8.3.2 The Interface Hazard Analysis (IHA), System Hazard Analysis (SHA), Operating & Support Hazard Analysis (OSHA) shall be conducted upon completion of the Preliminary Hazard Analysis.

8.8.3.3 Hazard log management shall be performed to ensure all the hazards are at an acceptable risk limits with suitable mitigation control measures.

8.8.3.4 Safety Assessment for the Safety functions to be performed, for example:

No.	Subsystem	Function
1	Propulsion	Speed controls including ATP/Brake interface
2	Brake	Emergency Brake application
3	Passenger doors	Emergency door release
4	HVAC	Smoke / Heat Detections
5	Driver Machine Interface	Manual coupling / uncoupling /Train Complete Interlocking
6	Train Management System	On-board control and monitoring functions

8.8.3.5 The Contractors shall prepare a Safety Critical Item List of equipment and LRUs classified by their impact on safety for Employer review.

8.8.3.6 In addition to the Hazard Log, the Contractor shall also set up and maintain a Register of Train Failures to document all scenarios which will result in a train failure. The causes, consequential effects and impact on train service shall be recorded for each entry in the Register.

8.8.3.7 The Contractor shall provide Quantitative Risk Assessment for the "top events" related to Hazard; for example:

1) Train collision on main line
2) Train derailment on main line
3) Fire in Train
4) Smouldering / Smoke in train

5) Train separation on main line

6) Undemanded passenger door opening on main line

8.8.3.8 The Contractor shall provide Safety Verification evidences to demonstrate that safety functions / features which are an integral part of the design shall work as intended. The process shall be covered by type test and commissioning tests on items of equipment critical to safety.

8.8.3.9 Design Safety Case and Final Safety Case or Safety repot for CP NS-03 Rolling Stock to be submitted for ISA review and Employer's Notice of No Objection to get a Taking Over Certificate (TOC) from the Employer.

8.8.4 Safety Report

8.8.4.1 The Contractor shall carry out Safety Assurance and provide Safety Reports to the Engineer to support the Rolling Stock safety application, in coordination with the Operator, to gain a TOC from the Engineer, and a final in-service safety report to support the Performance Certificate application.

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1) Technical Justification for Rolling Stock safety; and

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1) The Safety application for in-service operations; and

2) The Safety Management System to be applied for in-service operations.

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9.1.2 Prior to their commencing work on the Contract, the Contractor shall submit for review by the Employer/Engineer, names, qualifications and experience of all the key personnel

Design reviews shall be conducted at each stage of the design process as specified. The Contractor shall start procurement, manufacturing, construction and installation after the outcome of the Engineer's review and the obtain the Notice of No Objection from the Employer.

1.4 Driver's Cab and Saloon Mock-Up

The Contractor shall provide a full size fully equipped driver's and saloon cab mock-up for evaluation of the cab design as specified in Sub-Clause ~~1.2.7~~1.5 of the ERT.

1.5 Train Operation Simulator Parts

The Contractor shall provide a Simulator parts as specified in Sub-Clause 2~~7~~9 of the ERT.

1.6 Manufacturing

The Contractor shall manufacture seven (7) 8-car trainsets, total of 56 vehicles. Manufacturing of the vehicles and equipment shall be carried out under accepted production and certified quality control processes to the JIS Q9001 or other equivalent standards approved by the Employer/Engineer.

1.7 Procurement of Materials, Components and Sub-Systems

The Contractor shall procure materials, components and sub-systems which are required for the Rolling Stock manufacturing. The materials to be used in the manufacturing shall be of high quality and comply with relevant international standards acceptable to the Employer/Engineer. All materials, components and sub-systems shall be procured from reputable suppliers which are ISO 9001 certified or working toward this certification.

1.8 Inspection, Testing and Commissioning

The Contractor shall test all vehicles to ensure compliance to the specified performances in the ERT. Tests are categorized into Factory Acceptance Test (FAT), Site Acceptance Test (SAT), Testing and Commissioning.

For the on-site testing and commissioning, the test shall follow requirements of JIS E4041 or other equivalent standards like IEC 61133 as a minimum.

~~IEC 61133.~~

FAT shall be conducted at the manufacturer's facility with SAT, Testing and Commissioning being conducted after delivery to the Site.

System Integration Test (SIT) shall be conducted by the Contractor together with Signaling, Telecommunications and other Contractors. The Contractor shall provide the necessary technical support to ensure the interface for each vehicle function satisfactorily as stipulated in this Contract.

1.9 Delivery of Rolling Stock to the Site

The Contractor shall deliver the completed Rolling Stock by whichever means necessary to the Site and depot as designated by the Employer/Engineer to meet the requirements of the Project delivery schedules and shall unload the Rolling Stock at the specified location agreed by the Employer/Engineer.
All cost associated with the Rolling Stock Delivery, all other deliverables under the

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1.5 Train Operation Simulator Parts

The Contractor shall provide a Simulator parts as specified in Sub-Clause 27 of the ERT.

1.6 Manufacturing

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All cost associated with the Rolling Stock Delivery, all other deliverables under the contract and any equipment etc. shall be borne by the Contractor.

1.10 Provision for Spare Parts and Special Tools

Add the following paragraph at the end of the existing third paragraph;

"In accordance with the agreement between the Bank and the Borrower, all equipment, materials and services to be supplied under the Contract shall have their origin in any eligible source countries indicated in the Loan Agreement and **the Appendix 1** "Eligible Source Country(ies) of Japanese ODA Loans" attached herewith."

Add the following paragraph at the end of Sub-clause 4.1:

The Contractor shall not impede or interfere with the normal operations and maintenance of the Philippines National Railway (PNR) and/or the Operator of North-South Commuter Railway (NSCR), activities of the PNR personnel and/or the personnel of NSCR's Operator, and/or normal movement of the PNR passengers and/or the NSCR's passengers.

4.2 Performance Security

Add the following Paragraph after the existing second paragraph:

"The Performance Securities shall be issued by a reputable bank or financial institution selected by the Contractor and consented to by the Employer, located and authorized to do business in the Republic of the Philippines.

The Contractor may obtain such a Performance Security from a foreign bank, subject to the Performance Security being "confirmed" by a reputable bank or financial institution consented to by the Employer, located and authorized to do business in the Republic of the Philippines.

In case the Contractor is a joint venture, the Performance Security issued by it will be in the name(s) of one of the followings:

(a) in the name of the joint venture, in case of a legally incorporated joint venture at the time of award of contract;

(b) in the names of all members of the joint venture in case that the joint venture has not been legally constituted into a legally enforceable a joint venture at the time of award of contract."

~~In case the Contractor is a joint venture, the Performance Security issued by it will be in the name of the joint venture, in case of a legally incorporated joint venture at the time of award of contract;~~

~~**Add the following paragraph after the existing fifth paragraph:**~~

~~"After the expiry of the Defect Notification for each Section for which the Taking-Over Certificate has been issued (for the definition of 'Section' refer to Contract Data, Sub-Clause 14.9), the value of the Performance Security will be reduced by the relevant percentage shown below;"~~

~~**Section**~~	~~**Number of Trainsets**~~	~~**Percentage (cumulative)**~~
~~KD 6~~	~~Trainsets 1-7~~	~~90%~~
~~KD 8~~	~~Completion of Trial Operation support and the whole of the Works.~~	~~100%~~

Add the following paragraph at the end of the existing third paragraph;

"In accordance with the agreement between the Bank and the Borrower, all equipment, materials and services to be supplied under the Contract shall have their origin in any eligible source countries indicated in the Loan Agreement and **the Appendix 1** "Eligible Source Country(ies) of Japanese ODA Loans" attached herewith."

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