REASON DOCUMENTS OF A FINAL DRAFT SPECIFICATION (RDSO/CG/S/24006) OF "SINGLE LEAF AUTOMATIC PLUG DOOR FOR VANDE BAHART TRAINSET CAR"

SN.	CLAUSE	DESCRIPTION OF CLAUSE	M/s FAIVELEY (1)	M/s TROLEX(2)	M/s AVADH RAIL INFRA (3)	M/s AND HI-TECH (4)	M/s RT VISION(5)	RDSO Remark
1	1.2	Automatic door systems in rolling stock are designed to open and close automatically. Sensors are integrated into the door system to detect obstacles during the closing process, preventing injuries or damage	Sensitive Edge to be clearly mentioned	----------	----------	----------	----------	Firm's comments acceptable. Para will be modified accordingly.
2	1.5	Following specification may be referred in conjunction with this specification: (i)EN 14752:2019 Railway applications: Body side entrance systems for rolling stock. (ii)EN 45545 Fire protections on railway vehicles. (iii)EN 50155 Railway applications: Rolling stock. Electronic equipment. (iv)EN 50306 Method of test for resistance to fire of unprotected small cables. (v)IEC 60077 Railway applications: Electric equipment for rolling stock. (vi)IEC 61373:2010 Railway applications: Rolling stock. Shock & Vibration Tests. (vii)EN 60529 Degree of protection provided by enclosures (IP Code). (viii)EN 50121 Railway applications: Electromagnetic compatibility. (ix)EN 50125 Railway applications: Environmental conditions for equipment. (x)EN 50126 Railway applications: Reliability, Availability, Maintainability and Safety (xii)EN 50215 Railway applications: Rolling Stock	SN (iii) & SN (xii) having similar requirements either or condition to be added.	----------	----------	----------	----------	This is list of standards which may be referred, so there is no need to change.

		Testing of rolling stock on Completion of construction and before entry into service IEC 60571 The Safety and reliability requirement of electronic equipment						
3	6.7	Source of manufacture of each component shall be provided by the vendor at the time of design stage.	Not comply, No sub-supplier details will be provided as the complete design is owned by FT. It is possible that FT may change the Sub-suppliers if the situation warrants.	----------	----------	----------	Detailing of C and D class components may not be irrelevant.	No need to change clause as these requirement are necessary for ensuring the traceability for quality of system.
4	6.8	Vendors shall ensure that single leaf automatic plug door system to that particular design are supplied with components manufactured from the sources as indicated at the time of design approval and used for type testing		----------	----------	----------	----------	
5	8.2	The supplier shall make effort to mount the door on the existing structure. There should not be any infringement with existing structure/accessories. This shall be agreed during design freeze.	Interface shall be mutually agreed during the design phase as the door system is one of the safety related product.	----------	----------	----------	----------	Noted
6	8.3	The supplier shall guarantee all internal interfaces of the system		----------	----------	----------	----------	
7	10.1.2	The single leaf automatic plug door system must be robust enough to encounter vibrations and jerks, light in weight and proven design. The mounting arrangement shall be designed to withstand satisfactorily the vibrations and shock encountered in service in compliance to EN 61373	----------	This will ensure development of product under "Make in India" as per clause 2.2 of this specification.	We manufacture automatic plug door under TOT with reputed company for supplies in world railway. However, for each country operation conditions are different so proven designs should be consider on the basis of their existing supply in World Railways not in Indian Railways.	To promote the “Make in India Policy” the designed Automatic plug type door system by an Indian company shall be tested/verified by Supplier and Tested by RDSO as per mentioned relevant door safety EN standards as per testing facility mentioned in STR and verified by field trail to proven the designed door system. Reason Justification: As per Clause 10.1.2 “proven design” means it is restriction for new Indian supplier who is willing to	Since the doors are new range of Indigenization. Proven Design word may disallow new vendor’s entry.	Agreed. Para will be modified accordingly

						design and supply a new door system according to RDSO Specification reference CG-WI-4.2.4 Ver.1.0. As per this clause the new supplier cannot supply the door system until not having collaboration with proven door system foreign collaborator. This clause gives benefits only to the existing supplier to stop competition in door System that is not in favour of New Indian Railways and Indian Supplier. To Promote and making successful of “Make in India Policy” an Indian supplier willing to design and supply to Indian railways to make the competition in system where only few suppliers (2) The requirement of proven or collaboration should not be mandatory. Also, to prove the design of new door system shall be according to test requirement of all relevant door safety standards and RDSO Specification reference CG-WI-4.2.4 Ver.1.0 and to be tested at Firm own test facilities/RDSO Test lab and verified by the necessary period of field Trail. For this requirement the necessary Test facilities M&P already specified to comply the test requirements. Therefore, it is requested to RDSO writing of proven design must be avoided, if we considered only proven design then Train -18/ Vande Bharat train set		

						never been developed by Indian Railways which was big success in the history of Indian Railways.		
8	10.1.7	The emergency device must be able to unlock the door even when there is no electric power or pneumatic pressure if activated then the train is in standstill.	Language error to be corrected (when instead of then)	----------	----------	----------	----------	Agreed. Corrections made.
9	10.2.1	Doors shall be fitted with transparent windows to allow passengers to identify the presence of a platform. Door windows shall be replaceable without removal of the door leaf.	Though it is possible to replace the window glass without the removal of door leaf it is strongly advised to remove the door leaf and replace the glass by keeping the door leaf horizontally.	----------	----------	----------	----------	Noted
10	10.2.4	All door windows shall be fitted with safety glass as per RDSO Specification C-K404 (Latest Revision) which shall be bonded with door leaf & sealant	or DIN 6701 and DVS 1618 Standard.	----------	----------	----------	----------	RCF Specification MDTS 089 latest revision shall be used.
11	10.3.1	Door guides and supports shall be mounted within the section of doorway protected by the door seals and other suitable means from inside and outside ensuring that no ingress of dust, debris, or any other foreign matter likely to result in excessive wear or incorrect operation of the door equipment.	Protection covers for Doors are not part of FT scope of supply.	----------	----------	----------	----------	Proper sealing against any foreign material is a functional requirement.
12	10.4.4	Limit switches used shall be of high reliability and with IP 65 protection.	Any switch that is not meeting IP65 shall have additional protection cover.	----------	----------	----------	----------	No need to change clause.
13	10.4.9	The door operating mechanism shall be housed within the car above the doorway lintels. The design shall provide ease of access for maintenance.	Interface shall be mutually agreed during the design phase as the door system is one of the safety related product.	----------	----------	----------	----------	

14	10.5.2	The door controller unit of a proven design shall be equipped with self – diagnostic functions and shall communicate with TCMS.	----------	This will ensure development of product under "Make in India" as per clause 2.2 of this specification.	----------	As per Clause 10.1.2 “proven design” means it is restriction for new Indian supplier who is willing to design and supply a new door system according to RDSO Specification reference CG-WI-4.2.4 Ver.1.0. As per this clause the new supplier cannot supply the door system until not having collaboration with proven door system foreign collaborator. This clause gives benefits only to the existing supplier to stop competition in door System that is not in favour of New Indian Railways and Indian Supplier. To Promote and making successful of “Make in India Policy” an Indian supplier willing to design and supply to Indian railways to make the competition in system where only few suppliers (2) The requirement of proven or collaboration should not be mandatory. Also, to prove the design of new door system shall be according to test requirement of all relevant door safety standards and RDSO Specification reference CG-WI-4.2.4 Ver.1.0 and to be tested at Firm own test facilities/RDSO Test Lab and verified by the necessary period of field Trail. For this requirement the necessary Test facilities M&P already specified to comply the test requirements. Therefore, it is requested	Since the doors are new range of Indigenization. Proven Design word may disallow new vendor’s entry.	Agreed. Para will be modified accordingly

						to RDSO writing of proven design must be avoided, if we considered only proven design then Train -18/ Vande Bharat train set never been developed by Indian Railways which was big success in the history of Indian Railways.		
15	10.5.6	An indication confirming that all doors are closed shall be provided in the driving cab on the both end driver desk through TCMS / train line wiring.	The train level wiring is not part of door system scope of supply.	----------	----------	----------	----------	Functionality is must. However, this may be finalized during integration with TCMS
16	10.5.7	The door position measurement and detection shall be accurate and real time measurement of the distance moved by each leaf. Door closed position shall be double checked through two independent arrangements. The control system shall be designed in such a manner that at least two independent faults shall occur at the same time before the respective door opens un-commanded if the door is not released.	Sentence to be corrected for single leaf plug door system.	----------	----------	----------	----------	Modified suitably.
17	10.5.8	The door controller unit shall qualify the electro-magnetic compatibility requirements as per EN 50121 – 3 – 2 and protective factors procured by casing as per EN 60529	For EN 60529 the level of IP to be defined.	----------	----------	----------	----------	Clause modified for more clarity.
18	10.5.9	Door system shall be at least SIL 2 compliant at train level for all the safety related functions and shall not allow •Spurious door opening when train not at standstill •Train departure with an open door •Non opening of doors in case of emergency The SIL levels as above shall be validated and shall ensure that the train shall not move from a station unless the doors are closed and locked unless	----------	----------	Door System shall be at least SIL 3 compliant at train level for all the safety related functions and shall not allow:- •Spurious door opening when train not at standstill •Train departure with an open door •Non opening of doors in case of emergency The SIL levels as above shall be validated and shall ensure that the train shall not move from a station	----------	As SIL 2 is applicable to Control Systems and Door is an Electro Mechanical Device.	Not agreed as SIL level is measurement of reliability & availability of a safety system and automatic door is a vital safety related control system.

		intentionally permitted by the crew member.			unless the doors are closed and locked unless intentionally permitted by the crew member.			
19	10.6.5	It shall be ensured that door operation is performed independently for each selected side of the train. There shall also be provision to perform door operation simultaneously on both sides of the train, if required in special conditions.	This requirement belongs to TCMS and train level wiring control circuits.	----------	----------	----------	----------	Noted
20	10.8.3	The isolation lock can only be operated when the door leaf is in fully closed position. If the door is closed & locked with the isolation lock, the safety loop shall be bypassed and inform the DCU about the “door cut out status” to TCMS	Activation of isolation is still possible when the door is in open position. It must be ensured that the activation of lock out is done after the door leaf is closed and locked manually by the crew.	----------	----------	----------	----------	Agreed. Para is modified accordingly.
21	10.9.4	If the obstacle is faced during closing, the automatic door shall reclose three (3) times, In the event that the automatic door fails to close following the three attempts, further door movement shall cease on the offending automatic door and door will go to and remain in full open position unless again command has been not generated.	Language need to be corrected also Faiveley suggest to keep the number attempt 5 times instead of 3 times.	----------	----------	----------	----------	Language changed for better understanding.
22	10.9.5	If the obstacle is faced during opening, then door shall stop at the same position and wait for new command. However, the door should be able to manually push in open or close direction either by passenger or crew member.	The attempt must be 3 times before the door goes to out of action.	----------	----------	----------	----------	No need to change the requirement.
23	10.9.7	The number of obstructions during opening or closing shall be logged by the door control system as an aid to diagnosing door system problems.	Language may be corrected.	----------	----------	----------	----------	Corrected.

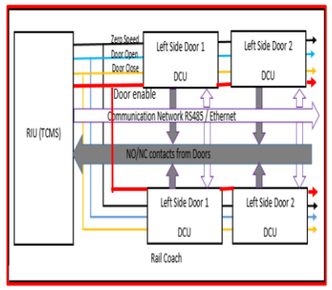
24	11.1	The door system shall be designed to facilitate the compatibility of different makes in a single rake.	NOT COMPLY. This requirement is complicated and do not belong to door system Scope the inter-operability need to be handled by TCMS/Propulsion Supply/train level control systems.	----------	----------	----------	----------	Not agreed as inter-operability shall be there.
25	11.2	The door system shall interface seamlessly with existing train control and communication System	Interface shall be mutually agreed during the design phase as the door System is one of the safety related product.	----------	----------	----------	----------	
26	12.1	The firm shall submit the following documents at the time of vendor registration for approval by Nodal agency nominated by Indian Railway for vendor development: (c)Load/strength calculation of door system along with FEA report G) List of spare parts for in-service requirements.	Item SL No "G" need to define with respective number of years	----------	----------	The requirement of FEA must be specified in specification for better design analysis.	----------	FEA requirement is already specified. Only list of applicable spare parts to be provided suitably for its service life.
27	12.2	The design shall be developed based on the space envelope available and technical & performance requirements given in this specification and sound engineering practice in accordance with the international standards. The firm shall submit 3D parametric Model and 2D drawings of the Single leaf Automatic plug door (the General arrangement and interface details with the car body) in hard (A1/A2 Size) and soft copy.	Envelope drawing details not available also it is not practical to have hard copy that details whole system hence the Car body 3D model need to share with door system supplier.	----------	----------	----------	----------	Not agreed. Reference drawing already given in annexure III of this specification. Firm has to provide all necessary 3D/2D drawings at the time of registration (if available) or Prototype test for examination.
28	12.3	These drawings shall contain the necessary details/dimensions as specified and shall show sufficiently sectioned view of the equipment so that every component of the equipment is identified		----------	----------	----------	----------	

29	12.4	Material grade / specifications for each component shall be indicated on the relevant drawings of the firm and the firm shall supply copies of translation in English of such specifications / drawings other than Indian Standards specification to Nodal agency nominated by Indian Railway for vendor development	Not comply. Individual component materials are intellectual property of FT so such information cannot provided.	----------	----------	----------	----------	Material grade / specifications for each component shall be indicated on the relevant drawings as it is required to ensure quality & better traceability.
30	13.1	The manufacturer shall offer at least 2 Nos. Prototype single leaf automatic plug door assembly complete for necessary testing in accordance to Para 15 of this specification. The tests for all the requirements as laid down in this specification are mandatory for product approval.	One (1) prototype is good enough for automatic doors based on FT experience.	----------	----------	----------	----------	Not Agreed.
31	13.2	The Prototype inspection of single leaf automatic plug door assembly shall be carried out at manufacturer's premises by authorized representatives of Nodal agency nominated by Indian Railway for vendor development. The manufacturer shall provide, without extra charges, material, tools and any other assistance, which may be considered necessary for any test / examination and dimensional checking.	Agreement of inspection must be developed based on EN 14752- 2019 Standard.	----------	----------	----------	----------	All tests are based in EN 14752 for door operation.
32	20.1	The initial warranty is 60 months from date of train commissioning or 72 months from date of supply. Firm shall replace free of cost at primary depot location of Indian railway the whole system or portion of items which malfunction during the warranty period.	The usual warranty period is 24 months from date of installation and Commissioning or from 36 months from date of supply with ever is earlier.	----------	----------	----------	----------	Not agreed.
33	20.2	The firm must offer CAMC along with OE offer for 72 months that is applicable from date of train commissioning or 78 months from date of supply. Firm has to submit the list along with unit price rate of the following: Must change spares Spares required during periodic overhauling any other spares that may be required		----------	----------	----------	----------	

34	22.6	Identification codes (manufacturer's name / trademark) and month & year of manufacture shall be punched / engraved on the main equipment and their component parts to avoid mixing by mistake of different applications and for setting down warranty claim for smooth and efficient working.	Identification labels also can be used if the strikers are capable of withstanding the environmental impact for at-least 72months	----------	----------	----------	----------	Noted
35	25.1	Adequate number of Railway officials shall be trained to cover all aspects of Single leaf automatic plug door for Vande Bharat Train set which shall cover familiarization maintenance, troubleshooting & functionality of various sub systems of automatic door. The number and days of training shall be mutually agreed between purchaser and supplier.	One week training is sufficient. The duration of the training shall be mentioned in RDSO specification	----------	----------	----------	----------	Duration may be mutually decided depending upon the personnel and no. of door systems.
36	Annex-I 3.2	Firm shall have following minimum M&P and Infrastructure at their works: i) Electro static charge free work and storage area to prevent sensitive components from damage during manufacturing, testing and storage. ii) Temperature controlled soldering and de-soldering work stations. iii) Temperature and humidity chamber. iv) CAD with suitable software license. v) Endurance Testing machine Designed for 5,00,000 Cycles vi) Assembly and polishing station vii) CNC Turning & Other regular tools like Measuring tape, Measuring scale, Magnifying glass, Laser Cutting Machine, Testing machine , Facilities for lifting and weighing , Weighing Scale, Necessary jigs & Fixtures for manufacture of components of door etc. used for manufacturing, electronic assembly line, inspection and testing of the Single Leaf Automatic Plug Door.	To be discussed in detail.	----------	----------	----------	----------	Noted

37	4.1	Firm should have following minimum testing facilities at their works: Facilities for measuring of Contact force during closing and opening of doors insulation tester Facility for measurement of contact force during closing and opening of doors. iii) Facility for measurement of contact force during closing and opening time of doors. iv)Digital Multi-meter with basic DC Voltage accuracy of at-least 0.5%. v)Power analyzer, Millivolt Drop Tester. vi)Power supply arrangement i.e. 24 V DC,110 V AC/DC vii)High Voltage Tester (2KV) & Insulation Tester viii)Powder Coating Thickness meter ix)Standard measuring gauges/instruments x) Digital oscilloscope xi)Functional and performance test bench xii)Any other test equipment considered necessary.	Point No (v) and '(x) is not applicable.	----------	----------	----------	----------	Agreed. Modified accordingly.
38	5.1	The firm should have acquired ISO: 9001certification from the agency accredited by an accreditation body which is a part of International Accreditation Forum (IAF), and the product for which the approval is sought should be broadly covered in the scope of the certification for manufacture and supply.	Firm should be IRIS certified.	----------	----------	----------	----------	To be deliberated with other suppliers before incorporating.
39	5.2	The Quality manual of the firm for ISO: 9001 should clearly indicate at every stage the control over manufacturing and testing of the said railway product.	Firm should be IRIS certified.	----------	----------	----------	----------	
40	5.3	There should be a system to ensure the traceability of the product from raw material stage to finished product stage. The system should also facilitate to identify the raw material composition from the finish product stage.	Applicable for sheet metal and casting those are having performance importance.	----------	----------	----------	----------	Clause is self-explanatory and is required for better traceability.

41	5.5	There should be at least one full time technologist having a minimum Master's degree in relevant field with experience of at least 3 years or Bachelor's degree in relevant field with experience of at least 5 years or a person with Diploma in relevant field with 12 years' experience. He should be free from day-to-day production, testing and quality control responsibilities. He should be mainly responsible for development of a product, analysis of products, control over raw material, and corrective action in case of difficulties in achieving the parameters	Firm should be IRIS certified.	----------	----------	----------	----------	Already clarified above in 5.1
42	5.6	Ensure that the in-charge of the Quality Control Section is having a qualification of minimum Master's degree in relevant field with experience of at least 3 years or Bachelor's degree in the relevant field with a minimum of 5 years' experience or alternatively he should be a Diploma holder with minimum of 12 years' experience. He should be actively involved in day-to-day activities of quality control / stage inspection / compliance of QAP etc.	Firm should be IRIS certified.	----------	----------	----------	----------	
43	5.7	The firm must ensure that proper analysis is being done on monthly basis to examine the rejections at various internal stages and it is documented. The firm must ensure that proper analysis is being done on monthly basis to examine the rejections at various internal stages and it is documented.	Firm should be IRIS certified.	----------	----------	----------	----------	
44	7.0	Training needs should be identified for all concerned officials and regular training shall be organized and imparted on maintenance of machines, quality assurance, safety parameters etc.	Firm should be IRIS certified.	----------	----------	----------	----------	

45	Annexure –II 2.1		This is the preliminary design detail design to be finalized during design stage. Safety loop details to be added	----------	----------	----------	----------	TCMS & Door Supplier shall finalise the TCMS Communication with automatic plug door system as per requirement of railways. So annexure–II is deleted.
46	2.2	Hardware interface details	All this signal must be through hard wire only. The word TCMS shall be replaced with Central control unit	----------	----------	----------	----------	
47	2.3.1& 2.3.2	Network interface details	Not applicable. Inter communication document must be finalized by TCMS vendor	----------	----------	----------	----------	
48	2.4	Status Bit details	Not applicable. Inter communication document must be finalized by TCMS vendor	----------	----------	----------	----------	
49	Annexure - III	Drawings	Drawing and 3D model to be shared to confirm.	----------	----------	----------	Kindly provide the drawings as per annex-III	Drawing details is already given in annexure –III. Same may be taken from ICF.
50	Annexure - II 2.5 (8)	One indicator for green loop / status about all close for all door closed.	NOT APPLICABLE. Not in door scope vendor for vande bharat.	Noted and complied. Shall ensure user friendly and ensure no confusion during operation of the doors.	This interface is directly in scope of TCMS so push button to close or open the door (provided in CAB interior) should not be in the scope of door manufacturer.	----------	Not in Door Scope.	Agreed. Para is deleted.
51	Annexure - I 3.2(iii)	Temperature and humidity chamber.	----------	----------	----------	The requirement of availability of temperature and humidity chamber in M&P must be reviewed for actual use for manufacturing Automatic Plug door.	----------	Agreed. Para is deleted.
52	4.1(viii)	Power Coating Thickness meter	----------	----------	----------	It should be Powder coating thickness tester; clause may be reviewed.	4.1 (viii) to be corrected as Powder Coating.	Corrected.

53	4.2	The firm should have arrangement for periodical calibration of all the equipment and test Instruments	----------	----------	----------	In-house calibration facility may not require for manufacturing of Automatic Plug door system	----------	Para is modified suitably.

M/s Harting has given comments regarding details of coach to coach connector :

We are already specified in your earlier specification for LHB doors and we have supplied multiple no of connectors and cable assemblies to approved suppliers of doors to Indian railways against the RDSO specification no (SPEC No. RDSO.2019/CG-01) for clause no 2.15 and 2.17 as attached for your kind reference.

Details of various part no of Harting/Phoenix make are attached with the comment.

RDSO Comment: the mentioned spec RDSO.2019/CG-01 is for automatic door opening and locking mechanism for BG coaches and not the automatic single leaf plug door system. Moreover, the mentioned clause 2.15 and 2.17 of RDSO.2019/CG-01 was in the draft version during revision only. No make specific components or sub-assemblies are being incorporated in this proposed specification of automatic single leaf plug door system.