REVISION OF SPECIFICATION / STR

Item Name: Standards of Infrastructure, Manufacturing, Testing and Quality Assurance Systems to qualify as Railway Wagon Builder.

Specification No. G105 Standards

1. RDSO is reviewing the specification/STR to cater to the latest technological developments in the field, modify clauses not relevant in the present context and making them more enabling with focus on functional requirements.

2. It is requested that your comments / suggestions with regard to improvements /modifications in specification / STR of the abovementioned item may be submitted in the following format alongwith the justification for the changes required.

Part A: Basic Information

SN	Particulars	Information
1.	Name	
2.	Designation	
3.	Professional Qualification	
4.	Organization / Firm's Name	
5.	Address for Correspondence	
6.	Contact No.	
7.	Email ID	
8.	Whether firm is registered with RDSO for the subject item. If yes, details like date of registration, current status etc If no, firm's experience in manufacturing of subject item or similar item	
8.	Whether any technical document/Report/Study to support suggested changes is available / enclosed for better appreciation	

Part B: Comments / suggestions on the specification

SN	Clause No. of RDSO STR/ Spec	Clause, as it exists in RDSO STR/ Spec	Clause , as it should read after incorporation of comments /suggestions in the RDSO Spec / STR	Justification for changes

Comments may be sent to following address within one month from the date of publication on rdso.indianrailways.gov.in

Director/Wagon
Research Designs and Standards Organization
Manak Nagar, Lucknow – 226011

Email: dswcdrdso@rdso.railnet.gov.in

INDIAN RAILWAYS

Standards
of
Infrastructure, Manufacturing, Testing and
Quality Assurance Systems
to qualify as
Railway Wagon Builder

S. No.	Month/Year of issue	Revision / Amendment	Page No.	Reason for Amendment
1.	June 2011	-	-	First issue

WAGON DIRECTORATE
RESEARCH DESIGNS AND STANDARDS ORGANISATION
MINISTRY OF RAILWAYS
LUCKNOW - 226 011

Price: 3200/-

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1.0 Preface

The railroad industry is characterized by advancing technology and correspondingly increasing concerns about safety, interchangeability, and cost. In this environment, it is essential that the products and services be designed and processed so as to conform to the requirements of the Indian Railways and that the processing be effected as economically as practicable.

This Standard, G – 105, is issued in supersession of G-93. This standard lays down requirements of infrastructure, manufacturing, testing facilities, quality assurance systems and the procedure for approval as Railway Wagon Builder. The standard is also intended to make the existing as well as the prospective private manufacturers aware of the compliance standards they have to fulfil to achieve certification. The Standard also lays down a system to permits growth of a certified wagon manufacturer in respect of installed capacity and types of wagons manufactured. The Standard also takes into account the possibility of complacency towards conformance after certification and lays down a system of continued conformance assurance and decertification under certain circumstances.

The standard incorporates modern manufacturing processes with levels of automation appropriate for wagon industry to promote a globally competitive wagon building industry in India. A considerable portion of the inputs to this effect have been drawn from the detailed deliberations done with the existing wagon builders after the quality audits done in May – July 2010. The process of certification to this standard, including registration, initial audit, and confirmatory audit, Grant of certificate, annual verification audit, periodic re-validation and withdrawal of certification constitute an integral, transparent part of this Standard.

A certificate issued to this Standard shall form a prerequisite for a wagon Manufacturer to be able to participate in wagon procurement RFP and Tenders issued directly by Indian Railways. Un-certified private wagon manufacturing works will not be permitted to manufacture wagons for Indian Railways.

However a wagon builder holding a certificate to this standard should have supplied a minimum of 500 wagons against Indian Railway orders or WIS/MWIS/LWIS out of which at least 250 numbers should have been in satisfactory service for a period of one year before being considered for regular procurement.

1.1 Scope

This standard covers the norms for objective evaluation of the Infrastructure, Manufacturing, Testing and Quality Assurance Requirements for manufacture & supply of Railway wagons. It also incorporates a regime of certification to this standard, including registration, initial audit, confirmatory audit, Grant of certificate, annual verification audit, periodic re-validation and withdrawal of certification.

1.1.1 One time provisional certification:

As this Standard replaces earlier system of verification against STR No. G 93 (Rev 5 of Feb 2009) , a special one time provision of issuing a provisional G 105 certificate has been included to permit erstwhile G-93 compliant wagon manufacturers who were considered eligible for placement of regular orders against centralized wagon procurement tender of Railway Board for the year 2009-10. A provisional G 105 certificate shall be issued by RDSO, suo-moto, along with publication of G 105 Standard. This certificate will be valid for a period of 18 months from the date of issue and will cover all the facilities of a manufacturer considered G-93 compliant against the centralized wagon procurement tender 2009-10 of Railway Board. The provisional certificate will not include type and capacity endorsement. This is a special one-time measure adopted to provide continuity and grant sufficient time to existing wagon manufacturers to migrate to new G-105 Standards. There shall be no extension of the provisional certificate for any reason whatsoever on any grounds and all existing regular wagon manufacturers are required to obtain G 105 certification for each of their wagon manufacturing works, failing which, the defaulter manufacturing works of a private wagon manufacturer shall cease to be eligible for wagon manufacture for Indian Railways. Such defaulter wagon manufacturing works shall require fresh certification under these Standards.

1.2 Procedure for Certification to G 105 standard

1.2.1 Introduction

i) The prospective wagon builder will apply to Executive Director Standards (Wagon), RDSO, Lucknow on prescribed application form for registration. The prescribed application form for registration shall be uploaded on RDSO's website for free down load. Lump sum fees, as indicated in the application form shall have to be deposited by the prospective wagon builder in accordance with extant instructions on the subject. Supporting Documents, as need be, may be attached with the registration form duly self attested by the prospective wagon builder. Separate applications are required for each separate facility manufacturing facilities, regardless of common ownership or control of those facilities. An indicated list of such documents is listed at Annexure I. The applicant shall be liable for truthfulness and correctness of disclosures and submissions made to RDSO during the process G 105 certification. Any misrepresentations or frauds as defined under Indian Contract Act 1872 (latest amendment) shall make the wagon manufacturer liable for black listing and imposition of a ban for supply of wagons for running on Indian Railways for a minimum period of three years , extendable to five years at the discretion of Indian Railways.

ii) The prospective wagon builder shall clearly state the category of wagons for which certification is sought viz.

a) Category I : Open/Hopper/Flat/Well Wagons
b) Category II : Tank and Special Wagons
c) Category III : Covered Wagons

iii) The application shall also mention the requested manufacturing capacity for assessment and certification in the following brackets :

a) 2 Wagons/day equivalent of 600 wagons per annum.
b) 4 Wagons /day equivalent of 1200 wagons per annum.
c) 8 Wagon/day equivalent of 2400 wagons per annum.

The above is considering 300 working days in a year

iv) If the application form and supporting documents submitted by the prospective wagon builder are found adequate and satisfactory by RDSO, the registration of the application for certification to G 105 Standards shall be confirmed and the prospective wagon builder shall be issued a letter for initial audit of the firm to the standard.

v) If the application form and supporting documents submitted by the prospective wagon builder are not found adequate and satisfactory by RDSO; the prospective wagon builder shall be communicated about the deficiencies and asked to address the same in a time bound manner.

1.2.2 Procedure of Initial Audit

i) The Initial Audit will be performed for all applicants seeking fresh certification to G-105 Standards, including those whose existing certificate has been withdrawn or whose revalidation period has lapsed. Initial audit will not be required for wagons builder seeking re-validation of pre-existing G-105 certificate within permissible time limit as laid down in this Standard.

ii) The initial audit of the prospective wagon builder will be done by auditor (s) to be nominated by EDSW, RDSO for verification of their facilities and capabilities as per requirements of G 105. The minimum requirements mentioned in Annexure III against an outturn of 2 wagons per day per facility to be certified shall be the benchmark for initial audit. Auditor under these standards will mean be one or more Indian Railway functionaries specifically assigned by EDS (Wagon), RDSO for the purpose.

iii) The initial audit of the prospective wagon builder shall be done to verify the compliance of the prospective wagon builder to the mandatory requirements specified in this standard.

iv) In case, no non conformities are found during the initial audit, a letter of initial audit completion shall be issued to the prospective wagon builder by EDSW/RDSO.

v) In case, non conformities are found during the initial audit, a Non Conformity Report shall be generated after the initial audit and shall be communicated to the prospective wagon builder for rectification in a time bound manner.

vi) Upon receipt of Action Taken Report from the prospective wagon builder, a follow up audit shall be done on the action taken by the Auditor.

vii) In case, non conformities found during the initial audit are found have been adequately and satisfactorily addressed during the first follow up audit, a letter

of initial audit completion shall be issued to the prospective wagon builder by EDSW.

viii) In case, non conformities are found during the follow up audit, a second Non Conformity Report shall be generated & the prospective wagon builder shall be again communicated about the same by RDSO. The prospective wagon builder shall be asked for rectification in a time bound manner.

ix) Upon receipt of Action Taken Report from the prospective wagon builder, a second follow up audit shall be done on the action taken by The Auditor.

x) In case, non conformities found during the initial audit & first follow up audit are found have been adequately and satisfactorily addressed during the second follow-up audit, a letter of initial audit completion shall be issued to the prospective wagon builder by EDSW.

xi) After issue of letter of Initial Audit Completion, confirmatory Audits for full certification shall be under taken, manufacturing facility-wise as described in these Standards.

xii) In case, during the second follow up audit it is found that the non conformities found during the initial audit & first follow up audit have been not addressed adequately and in a satisfactory manner, the registration of the prospective wagon builder shall be cancelled. The same shall be communicated to the prospective wagon builder. The decision of EDSW in this regard shall be final. In such a case, the prospective wagon builder shall have to apply afresh after a of minimum 6 months from the date of cancellation of registration for the specific wagon manufacturing facility, along with the requisite fees, to RDSO in the manner prescribed in these Standards even if certification is sought for the same facility again.

1.2.3 Procedure of Confirmatory Audit

i) The confirmatory audit of the prospective wagon builder shall be done within 6 months of the issue of letter of initial audit completion on request of the prospective wagon builder. In case no such request is received within 6 months of issue of letter of initial audit completion, the registration of the prospective wagon builder shall be cancelled. The same shall be communicated to the prospective wagon builder. The decision of EDSW in this regard shall be final. In such a case, the prospective wagon builder shall have to apply afresh after a lapse of at least 6 months of cancellation of registration, along with the requisite fees, to RDSO in the manner prescribed in these paras even if certification is sought for the same facility again.

ii) The confirmatory audit shall be done to verify the compliance of the prospective wagon builder to all the requirements specified in this standard, to the extent applicable to the applicant for the manufacturing facility registered for G-105 certification. The applicant shall be communicated the dates of confirmatory audit at least 30 days in advance.

iii) The confirmatory audit of the prospective wagon manufacturing facility will be done by the auditor (s). Auditor under these standards will mean be one or more Indian Railway functionaries specifically assigned by EDS (Wagon), RDSO for the purpose. Items likely to be checked in the confirmatory audit are listed in Annexure II. This is an indicative list only and the actual audit may expand the scope of the audit depending upon the documents submitted and results observed in previous audits.

iv) In case, non conformities are found during the confirmatory audit, a Non Conformity Report shall be generated and shall be communicated to the applicant for rectification in a time bound manner.

v) Upon receipt of Action Taken Report from the applicant, a follow up of confirmatory audit shall be done on the action taken by the Auditor.

vi) In case, non conformities are found during the follow up audit, a second Non Conformity Report shall be generated and shall be communicated to the applicant for rectification in a time bound manner.

vii) Upon receipt of Action Taken Report from the prospective wagon builder, a second follow up of confirmatory audit shall be done on the action taken by the Auditor. The prospective wagon builder may be asked, by EDSW/RDSO, to manufacture a prototype wagon (s) (of the category/categories for which certification is sought) to be checked and tested as per the concerned specification by audit team during the confirmatory audit after placement of order. New entrant may be further asked to manufacture second prototype during manufacture of the development lot to establish maturity of manufacturing process and adherence to quality standard. The prototypes will be tested as first article as per laid down drawings, specification etc.

viii) In case, non conformities found during the confirmatory audit, at any stage, are found have been adequately and satisfactorily addressed during the first follow up audit, a certificate of compliance to G 105 standard, in the format given in Annexure V, shall be issued by RDSO to the applicant for the respective Wagon Manufacturing Facility. The overall capacity mentioned in the certificate shall only be indicative.

ix) In case, during the second follow up audit it is found that non conformities found during the confirmatory audit & first follow up audit have been not addressed adequately and in a satisfactory manner, a notice of 3 months shall be given to the applicant to remove all non-conformances, call for the final follow up audit and satisfy the Auditor within the notice period. In case non-conformities persist at this stage, the registration of the prospective wagon builder shall be cancelled. The same shall be communicated to the applicant. The decision of EDSW in this regard shall be final. In such a case, the applicant shall have to apply afresh after a gap of at least 6 months from

the date of cancellation of registration, along with the requisite fees, to RDSO in the manner prescribed in these Standards, even if certification is sought for the same facility again.

1.2.4 Annual Verification Audits

Annual Verification Audits of the wagon builder shall be done by the auditor (s) nominated by EDSW. Verification audits may address all or selected requirements stated in this standard. Product audits may be conducted in lieu of or in conjunction with verification audits at the discretion of the EDSW, RDSO. Non Conformity Report (NCR), generated during such audits, if any, shall have to be cleared by the wagon builder and confirmation issued to RDSO within 6 months of issue of the NCR. Conduct of annual verification audits of the applicant under these Standards may be entrusted by EDSW/RDSO to suitable quality auditing agencies of international repute at his discretion.

1.3 Procedure for Re-Validation/ Enhancement of existing certificate to G 105 standard

i. G 105 certification of railway wagon builders will have a validity of 3 years (from the date of issue) at a time, subject to annual verification audits as required, followed by re-validation. Re-validation of certification is not automatic and can be denied if the wagon builder has demonstrated an inability or unwillingness to resolve non-compliances. Re-validation of certification each 3-year period will be based on past performance and having had all non-compliances resolved.

ii. The wagon builder will apply to Executive Director Standards (Wagon), RDSO, Lucknow on prescribed application form for re-validation ***at least six months before*** the expiry of the certificate. The prescribed application form for re-validation shall be uploaded on RDSO's website for free down load. Supporting Documents, as need be, may be attached with the re-validation form duly self attested by the prospective wagon builder. Separate applications are required for each separate facility manufacturing facilities, regardless of common ownership or control of those facilities. Registration for enhancement of certificate can be done at any time during the validity by applying on a prescribed form along with supporting documents mentioned therein.

iii. If the application form and supporting documents submitted by the wagon builder are found adequate and satisfactory by RDSO, the prospective wagon builder shall be issued with a letter for Confirmatory audit for revalidation/ Enhancement of G-105 certificate for the applicant's manufacturing facility. This letter, in case of revalidation application, along with a copy of expired certificate, shall fulfill the requirement of "a Valid G-105 certificate" for a wagon builder to participate in Wagon Procurement tenders of Railway Board provided; the firm has not been served with the letter of De-certification by RDSO.

iv. If the application form and supporting documents submitted by the wagon builder are not found adequate and satisfactory by RDSO; the prospective wagon builder shall be communicated about the deficiencies and asked to address the same in a time bound manner.

v. Enhancement of certificate for addition of capacity or an additional wagon type to an existing certified wagon manufacturing facility may also be requested as a part of the application for revalidation of G-105 certificate. The procedure for revalidation shall be applicable in such cases.

vi. The procedure for re-validation / enhancement audit will be same as that for confirmatory audits described in these Standards which shall be performed by the auditor.

vii. In case, non -conformities found during the re-validation / enhancement audit are found have been adequately and satisfactorily addressed at any stage during confirmatory audits for revalidation, a certificate of conformance to G 105 standard, in the format given in Annexure V, shall be issued to the wagon builder by RDSO. The revalidated certificate shall indicate the certificate no. and expiry date of the previous certificate and shall be valid for a period of 3 years from the date of expiry of the previous certificate. In case of mid term enhancement of a valid certificate, a fresh enhanced certificate will be issued with the same date of validity as the original certificate. The overall capacity mentioned in the certificate shall only be indicative
If the applicant is unable to remove non-conformance, process to be followed shall be same as clause 1.2.3 (ix) but for enhancement application , a rejection of enhancement request will be issued by EDSW/RDSO and for revalidation application (with or without enhancement), a letter of De- Certification will be issued. The applicant will be given maximum 6 months time from the date of expiry of the previous G-105 certificate to achieve re-validation of G-105 certificate, failing which the request for revalidation of the concerned facility will be denied and a letter of de-certification shall be issued by EDSW/RDSO.

viii. In the event de-certification, the concerned wagon builder may, if so preferred, seek a review by submitting a request to EDSW/RDSO within 30 days of the date of decertification letter.

ix. In case de-certification is upheld after appeal, the prospective wagon builder shall have to apply afresh for certification, along with the requisite fees, to RDSO in the manner prescribed in these paras even if certification is sought for the same facility again. Such an application can be made after a gap of at least 6 months from the date of the letter of Decertification.

1.4 Mid Term Withdrawl of certification

i. G 105 certification of railway wagon builder may be withdrawn upon documented adverse performance. Documented adverse performance shall include, but will not limit to:

a) Non compliance of Annual verification audit NCRs.
b) Quality rating index below stated limits.
c) Fraud or misrepresentations resulting in losses to Railways.
d) Unattended valid warranty complaints from Zonal Railways.

ii. G 105 certification of railway wagon builder may also be withdrawn in case the entire factory has produced no wagons continuously for a period of 12 months on account of any reason including closure/shutdown/lock out but excluding lack of orders.

iii. In case the certificate of the wagon builder is proposed to be withdrawn, a show cause notice shall be served by EDSW/RDSO to the wagon builder for submission of reply within 30 days from the date of notice.

iv. Withdrawal of certification shall be communicated in writing to the concerned wagon builder. A copy shall also be marked to Mechanical, Finance and Stores Directorate of Railway Board.

v. G 105 certification of railway wagon builder can also be withdrawn directly by RDSO in case the wagon builder is black listed or business dealing with the wagon builder is banned by Government of India or its offices on communication of such a ban by Railway Board. In such a case, no show cause notice shall be given to the wagon builder.

1.5 Submission of compliance of infrastructural requirements by the applicant:

1.5.1 Method of indicating compliance to the requirements

a) Some of the requirements apply to manufacture of specific types of wagons, as mentioned in the respective clauses

b) The applicant shall clearly indicate the compliance of requirements by indicating YES or NO or NA (not applicable) for the concerned wagon manufacturing facility. The brief details of compliance shall be furnished. The reasons and brief justification for the requirement which is not applicable shall also be furnished

c) While submitting the compliance of Annexure-III to these standards, the wagon builder shall indicate the following details:

S. No.	Clause of G 105	Brief description of the requirement	Status of Compliance YES/NO/NA	Details of Compliance

d) A summary shall also be given by the wagon builders as below:

S. No.	Category	Total requirements	Fully complied
1.	Mandatory		
2.	Others		

1.5.2 Requirements

The prospective wagon builder must fulfill the requirements as listed in Annexure-III, to the extent applicable (depending upon the type of wagon proposed for manufacture).

1.6 Amendment to G 105 and migration to the amended standard

The amendment to this standard, if any, in the future shall be serially numbered. Normally 18 months time shall be given to the wagon builders to migrate to the amended Standards which shall normally be checked through Annual Verification Audits and Revalidation audits. All new certifications will only be done to the prevailing current version of the G-105 Standards. Amendments to the standard shall be issued after approval of Railway Board.

1.7 Upgradation of G 105 Standard

Indian Railways have recently entered in to a consultancy contract for developing many other procedures and standard for wagon manufacturing and quality assurance. The outcome of these measures will lead to further upgradation of these standards.

Annexure I

Documents/formats to be submitted by the prospective wagon builder
(with proper index and each page having numbering in the format 'x of y')

1. Organization Chart
2. Quality Control Organization Chart
3. Name, Qualification & Experience of Key Personnel of Quality Control Organization
4. Description of Quality Control of raw material, free supply items, bought out items, tooling, jigs, fixtures, templates, dies, cutting, welding, riveting, shot blasting, painting, etc.
5. Compliance Status of G 105 Requirements (Separately for Mandatory and Others) with Description, Quantity, Machine No, Identification Number, Make, Capacity, Year of Commissioning, Status (working/not working), Ownership & Calibration Status.
6. Calculation of manufacturing capacity of the facility
7. List with description, quantity, identification number, make, year of manufacturing/ commissioning, calibration frequency and calibration status of following:
   a. Drilling jigs b) Welding fixtures, c) Marking templates, d) Profile Templates, e) Forging dies, f) Gauges
8. Procedure of Calibration of M& P, tools, equipments, jigs, fixtures, templates, etc.
9. Production Flow Chart
10. Sequence of Operations with list of components in the format containing following columns (it should include all components of an assembly/sub-assembly): (Only formats to be submitted at the time of certification. Details to be submitted along with the call for prototype inspection)
    a) Name of Assembly/Sub-assembly/Component
    b) Nos. required per Wagon/Assembly/Sub-assembly
    c) In-house or Bought Out
    d) Grade of Material
    e) Dimensions of sheets (L X W x H/T)
    f) Approx. Weight (in Kg)
    g) Acceptance Criteria/Tolerance
    h) Operation performed
    i) Done by (means)
    j) Sample size of Internal Inspection
    k) Frequency of internal inspection
11. List of bought out items (Only list of general items be submitted along with the application)
12. List of shop made components (Only list of general items be submitted along with the application)
13. Inspection formats (Only list of general formats be submitted along with the application)
14. List of welding personnel, along-with their qualification, test certificates & experience
15. Format for checking of welding equipment
16. Procedure of purchase of components
17. Procedure of removal of non-conformities
18. ERP Capabilities Details
19. Customer complaint redressal system:
    a. Key person responsible for complaint redressal (Give contact No. also).
    b. Complaint redressal mechanism.

Annexure II

Indicative checklist for confirmatory audit of prospective wagon builders

In addition to verify the facilities mentioned in Annexure III, as applicable to the prospective wagon builder, the following would also be checked during the confirmatory audit:

1.	Management and Line Supervision	Status of the firm
1.1	Do wagon builder's quality assurance policy/quality assurance plans indicate recognition of separation of responsibility for production and quality control supervision functions?	
1.2	Does the organization chart clearly show lines of plant management authority and responsibility down to principal plant departmental supervisors?	
1.3	Are assigned personnel for key positions in manufacturing qualified by training and experience?	
1.4	Are supervisors qualified by experience and/or education or training programs?	
2	Specifications	
2.1	Are there adequate procedures to ensure that obsolete drawings and documents are destroyed or isolated from use?	
2.2	Are there adequate procedures for distributing new and revised drawings to the shop force?	
2.3	System for raw materials inspected upon receipt and marked for permanent identification?	
2.4	System for all other purchased materials (wheels, brakes, castings, etc.) checked for conformance with the purchasing document upon receipt?	
2.5	System for raw material test reports kept on file?	
2.6	Marking system that ensures the intended application of material cut from larger pieces?	
3.	Welding, Fabrication, and Construction Practices	
3.1	Does the facility have a welding technician or an outside expert available on call to perform welding tests and resolve welding questions?	
3.2	Does the person have the authority to control welding procedures in the shop?	
3.3	Does this person control and/or "police" the setting of welding machines?	
3.4	Are welders, welding operators, and welding procedures qualified per IS Specification latest revision?	

3.5	Is there a record of welder and welding operator qualifications?	
3.6	Are welds and procedures acceptable under the provisions of RDSO's latest WPS?	
3.7	Are electrode wires and gas shield properly stored and identified?	
4.	Quality Control	
4.1	Does the quality control organization include a quality control supervisor who can demonstrate an adequate knowledge of the car construction process?	
4.2	Is there an in-process inspection procedure to ensure that the car is properly fabricated and assembled?	
4.3	Does Quality Control have authority to stop and responsibility to inform operating supervision of nonconforming work?	
4.4	Are there adequate procedures for correcting nonconforming material or work in process rejected by Quality Control forces?	
4.5	Are there adequate procedures for the inspection of purchased material and manufactured items?	
4.6	Are contract specifications and special provisions in the Quality Control file?	
4.7	Do all wagons receive an adequate final inspection, and is a record kept of this inspection?	
4.8	Is there office space for outside inspectors?	
4.9	Are there procedures for liaison with outside inspectors?	
5.	Facilities	
5.1	Does the wagon builder have a mechanism to simulate minimum curve requirements?	
5.2	Does the wagon builder have possession of weighbridge with valid calibration by weight and measures department of the concerned state government?	
5.3	Does the wagon builder have designated level track for adjustment of side bearings and coupler height?	
5.4	Is there proper storage for paint and brake components, particularly valves, cylinders, and pistons?	
5.5	Does the wagon builder works have suitable and adequate painting facilities and post painting drying facilities to cater to the specification of wagon concerned?	

6.	Operations	
6.1	Are grade of material and marking verified prior to fabrication?	
6.2	Is raw material properly stacked and handled to prevent permanent distortion?	
6.3	Does the facility have yard space, handling, and other equipment to store and handle materials?	
7.	Test Devices	
7.1	Does the wagon builder have brake force measuring devices available?	
7.2	Does the wagon builder have a single car test device?	
7.3	Is the single car test device tested in accordance with the latest RDSO requirements?	
7.4	Are torque wrenches periodically calibrated?	
8.	Maintenance of Equipment	
8.1	Is there an adequate plan for the systematic maintenance of equipment?	
8.2	Are the equipment and tools periodically inspected and restored to intended tolerance?	
8.3	Are welding machines periodically checked to ensure correct amperage and voltage readings?	
9.	Engineering and Drafting	
9.1	Do personnel have an adequate knowledge of the applicable codes and specifications?	
9.2	Is there a current reference library of specifications, including the latest revisions of all relevant RDSO/IS/AAR/UIC codes/manuals	
9.3	Is a current list of design and shop detail drawings with latest revisions maintained?	
9.4	Are copies of approved special procedures, in addition to welding, furnished to quality control and production supervisors?	
9.5	Does the wagon builder have access to engineering testing support facilities? A list of major testing equipment should be provided	

Annexure III

Infrastructure, Manufacturing, Testing and Quality Assurance Requirements to qualify as Railway Wagon Builder

1. General Requirements

S. No.	Requirement	Nature of Requirement	2 wagon outturn/day	4 wagon outturn/day	8 wagon outturn/day
a)	The wagon building works must have provision for a Railway siding. Siding construction should be complete by the prospective wagon builder up to railway land boundary and all encumbrances for the work of connection of the siding to Railway Station or Railway Yard on railway land should have been removed, all relevant permissions obtained, and all relevant payments have been made along with a reasonable certainty of connection being totally operational in a short reasonable time frame from the date request for conducting initial audit is received at RDSO. This should be supported by a certificate issued by concerned Railway Administration at Divisional level to this effect. As a mandatory check, the first prototype inspection shall not be carried out until Siding Connection to a Railway station or Railway yard is ready and approved by Railways for movement of the freight stock from/to the manufacturing unit.	Mandatory	Yes	Yes	Yes
b)	The wagon building works should have a fully computerized system for real time maintenance of records encompassing all activities of wagon manufacturing including receipt, consumption of, bought out items, shop made items, sub-assemblies manufacturing, wagon assembly, customer complaint redressal, staff details, traceability, etc. An ERP package shall be preferred;		Yes	Yes	Yes

c)	Arrangements for adequate power backup facility (availability of generators etc) for running important M&P's and testing equipments should be available	Mandatory	Yes	Yes	Yes
d)	The facility for which certification is sought should be certified ISO 9001 (latest edition) for the entire range of manufacturing, testing and quality assurance activities.		Yes	Yes	Yes
e)	Wagon building works must have ISO 14001 certification		Yes	Yes	Yes
f)	The wagon builder must have a quality assurance plan covering the items listed in Annexure I	Mandatory	Yes	Yes	Yes
g)	Wagon Builder should have a website on which information related to various types of wagons manufactured with individual numbers in past years should be available. The web-site should also have provision for free flow of information between Railway Board, RDSO, Wagon Builders and Zonal Railways.		Yes	Yes	Yes

2. Infrastructural Requirements

S. No.	Requirement	Nature of Requirement	2 wagon outturn/day	4 wagon outturn/day	8 wagon outturn/day
a)	Covered bay area served by EOT Cranes should be available for manufacture of sub-assemblies and assembly of Wagons	Mandatory	2000 m^2	4000 m^2	7500 m^2

b)	Height of covered area in the assembly bay served by EOT cranes should be such that the cranes while carrying a completely assembled wagon (minus bogies) should be able to travel over another assembled wagon resting on the assembly jig or on its wheels/bogies on the floor. Alternately: The width of covered assembly bay should be such that a completely assembled wagon without bogies may be carried by the side of another assembled wagon resting on assembly jig or on its wheels/ bogies on the floor using the EOT cranes available in the bay (In case and as applicable to the layout of the works)	Mandatory	Yes	Yes	Yes
c)	A separate dispatch line of length for holding at least one week outturn for inspection and testing of wagons (dispatch line) by purchaser's inspecting Engineers should be provided. The complete dispatch line should be served by facilities for air brake testing.	Mandatory	160 m	320m	600 m
d)	The dispatch line should be provided with a pit of the length of minimum 20 meter length with proper drainage and lighting.	Mandatory	Yes	Yes	Yes
e)	The premises should have adequate covered storage area to store components/sub-assemblies such as air-brake equipment, coupler, draft gears, cartridge bearings and other bought-out components etc, which are likely to deteriorate if stored in open.	Mandatory	Yes	Yes	Yes
f)	There should be open/covered storage area at adequately higher level than the surrounding area to prevent the damage to stores from rain water/flooding for storing two months requirement of steel, bogies etc.		800 m2	1500 m2	3000 m2

g)	Covered storage area for wheel sets mounted with CTRBs should be provided with a single track or multilevel track. Alternatively, wheel sets mounted with CTRBs can be stored in specially constructed racks well protected from possibility of damage.	Mandatory	Yes	Yes	Yes
h)	Separate work areas for fabrication of stainless steel (IRS: M44) wagons should exist		Yes	Yes	Yes
i)	Separate storage area for stainless steel (IRS: M44) should exist.		Yes	Yes	Yes

3. Machinery & Plant Requirements

S. No.	Requirement	Nature of Requirement	2 wagon outturn/day	4 wagon outturn/day	8 wagon outturn/day
a)	In case and as applicable to the wagon lifting layout of the works, each covered assembly bay should be served by at least a minimum of 2 EOT cranes, each of minimum 10 T capacity, or at least one minimum 20 T capacity crane with suitable lifting tackles so as to avoid any damage to wagon body while lifting	Mandatory	Yes	Yes	Yes
b)	Each sub - assembly bay should be served by at least 2 Nos. EOT cranes of minimum 3T capacity	Mandatory	Yes	Yes	Yes
c)	The steelyard (the open/covered area for storage of steel, wheel sets, bogies coupler, draft gears etc) should be served by one EOT/Portal of minimum 5 T capacities or a mobile crane of minimum 5 t capacity.	Mandatory	Yes	Yes	Yes

d)	The following material handling equipments in adequate number should also be provided: i) Forklifts of minimum 2 T capacity and/or Diesel/ Battery operated platform of minimum 2 T capacity or suitable equivalent arrangement. ii) Diesel/Battery driven shunting locomotives or loco pulsar or suitable power winch or tractor with suitable attachment. iii) Traverser, wherever the layout demands its requirement.		Yes	Yes	Yes
e)	Electrically driven compressors capable of adequate FAD at a Pressure of 7 bars should be provided.	Mandatory	Yes	Yes	Yes
f)	MIG/MAG Welding Machines should be available. Centralized supply of gas for these machines should be in place, preferably.	Mandatory	8	15	20
g)	Robotic Welding Facilities should be provided for manufacture of sub-assemblies like side walls and end walls for the wagon production		Yes	Yes	Yes
h)	One set of submerged arc-welding equipment of 1200 A rating should be provided.	Mandatory	Yes	Yes	Yes
i)	Powered mechanized welding manipulator and fixtures to ensure down hand welding for relevant type wagon should be provided for the following: i) Under frame ii) Sub-Assemblies iii) Main Assembly (Both boxing and welding manipulator)	Mandatory	One Set	One Set	Two Sets

j)	Under frame fixture and at least 50% of other fixtures should have hydraulic /or pneumatic clamping arrangement. In remaining fixtures, all the critical locators/stopper faces of fixture should be machined to achieve better accuracy, instead of gas cutting. Also, stoppers and locators should be screwed (or) bolted instead of being tack welded for achieving better alignment and accuracy		One Set	Two Sets	Three Sets
k)	CNC Plasma/Water jet profile Cutting Machines	Mandatory	One	One	Two
l)	CNC or a Gang Drilling Machines with minimum 2 drilling-heads of 38 mm capacity for sole bar & centre sill with minimum 15m long gang-drilling bed suitable for holding centre sill & side	Mandatory	One	One	One
m)	One CNC press brake of adequate capacity should be available		One	One	One
n)	Equipment for straightening channels and angles to bring them within the tolerance limit laid down in IS: 1852 and capable of achieving the camber (if applicable to the wagon concerned).	Mandatory	One	One	One
o)	Cold power saw for cutting structural members.	Mandatory	One	Two	Four
p)	PLC controlled Multiple Roller Type Plate Straightening machine of capacity 2.5 m x 12 mm.	Mandatory	One	One	One
q)	CNC Shearing Machine of capacity 16 mm x 2.5 mm or more	Mandatory	One	One	One
r)	Portable edge preparation machine	Mandatory	One	One	Two
s)	Laser collimator with digital reading and recording for measuring the camber and alignment.	Mandatory	One	One	One

t)	Semi/fully automatic Shot Blasting Machine with auto shot reclamation, capable of giving finish up to Sa 2.5	Mandatory	One	One	One
u)	Lock Bolting Machine (For concerned wagon outturn) :	Mandatory	Four	Six	Eight
v)	A hydraulic press of a capacity of 300 Ton should be available (Applicable for Hopper Wagons only)	Mandatory	One	One	One
w)	Adequate sets of Measuring instruments, gauges (weld gauges, dimensional gauges), etc. in kit form, for three wagon outturn per day should be available Measuring instruments should have provision of digital readout, to the extent possible.	Mandatory	Yes	Yes	Yes

4. Testing & Measurement Requirements

S. No.	Requirement	Nature of Requirement	2 wagon outturn/day	4 wagon outturn/day	8 wagon outturn/day
a)	The Wagon manufacturer shall have necessary infrastructure for conducting load test as per the requirement stipulated in particular and general specification of the wagons. For this purpose, availability of a stretch of perfectly level track is essential.	Mandatory	Yes	Yes	Yes
b)	The manufacturer shall have the facilities for conducting curve test on pattern wagon under frame as per the general specification, inspection procedure. For this purpose, the minimum curve of 152m for Broad or simulation thereof is essential.	Mandatory	Yes	Yes	Yes

c)	Facilities (as per RDSO's latest drawings) for carrying-out shower test to ensure water tightness of the Wagon should be provided (applicable only to covered wagon manufacturer).	Mandatory	Yes	Yes	Yes
d)	The facilities for discharge test for Hopper Wagon should be available (applicable only to Hopper Wagon manufacturer).	Mandatory	Yes	Yes	Yes
e)	The facilities for air assisted discharge test for covered wagons suitable for carrying bulk commodities should be available (applicable only to bulk cement/fly ash/alumina powder wagons).	Mandatory	Yes	Yes	Yes
f)	The firms should have Squeeze load test rig for giving squeeze load up to 300 tones	Mandatory	Yes	Yes	Yes
g)	Facility for measuring Brake Block force simultaneously in one complete wagon with automatic recording should be available	Mandatory	Yes	Yes	Yes
h)	The Wagon builder should possess within his works electronic weigh bridge facilities with printing arrangement suitable for weighment of at least a complete eight wheeler bogie wagon at a time.	Mandatory	Yes	Yes	Yes

5. Additional Requirements for Tank Wagon Manufacture

S. No.	Requirement	Nature of Requirement	2 wagon outturn/day	4 wagon outturn/day	8 wagon outturn/day
a)	Clearance of Chief Commissioner of Explosives should be available for the tank wagon manufacturing facility manufacturing pressurized tank wagons like Petrol/ LPG/CNG tank wagons etc.	Mandatory	Yes	Yes	Yes

b)	All tank wagon manufacturers must have proper facility for calibration of tank barrel. The facilities must have approval of Central Tank Wagon Calibration Committee. The bulk flow meter used for this purpose must be duly certified and sealed by the inspector of Weights and Measures.	Mandatory	Yes	Yes	Yes
c)	The tank wagon manufacturer should either have in-house facilities for radiographic examination, ultrasonic examination and Dye penetration for testing welds or should have a permanent arrangement from an BARC/NABL (as the case may be) approved Source	Mandatory	Yes	Yes	Yes
d)	The wagon builder who would manufacture pressure tank wagons for carrying LPG, Liquid Ammonia, etc., must provide the facilities for stress relieving of the barrels in accordance with para-12 of IS: 2825.	Mandatory	Yes	Yes	Yes
e)	Length of furnace for stress relieving should be adequate enough to place full barrel and should have uniform heating zones & automatic temp recording facilities.	Mandatory	Yes	Yes	Yes
f)	Suitable facilities for forming of dished ends for tank barrels should either be provided in house or outsourcing from approved sources.		Yes	Yes	Yes
g)	The tank wagon manufacturers should have hydraulic/pneumatic test facilities for testing of the barrel up-to the pressure specified in the particular specifications	Mandatory	Yes	Yes	Yes
h)	Sub-merged arc welding machines provided with welding booms & mechanical/ motorized rotators should be available.	Mandatory	Yes	Yes	Yes

i)	A facility to check the barrel / barrel plates by ultrasonic test as per specified ASTM after its manufacture should be available (this is applicable for BTPGLN Wagons only).	Mandatory	Yes	Yes	Yes
j)	It has to be ensured that a system exist for testing of LPG dome fittings. Method of certification should be suitably documented.		Yes	Yes	Yes
k)	It has to be ensured that suitable stands and gantry are available for attending to diaphragm plates fitted with pipes and LPG dome fittings.	Mandatory	Yes	Yes	Yes
l)	Plate rolling machine of the capacity up to 2.5 m or above x 12 mm should be available	Mandatory	Yes	Yes	Yes

6. Facilities for mounting of cartridge/roller bearing

S. No.	Requirement	Nature of Requirement	2 wagon outturn/day	4 wagon outturn/day	8 wagon outturn/day
a)	A separate covered shed protected from dust ingress and connected to wheel storage parking line by a Railway track should be provided for pressing of cartridge/ roller bearings on axle journals.	Mandatory	Yes	Yes	Yes
b)	Dust proof CTRB mounting room	Mandatory	Yes	Yes	Yes
c)	Ensure that a system exists for protection and bearings and grease drums to prevent ingress of dust /moisture.	Mandatory	Yes	Yes	Yes

7. Design Infrastructure Requirements:

S. No.	Requirement	Nature of Requirement	2 wagon outturn/day	4 wagon outturn/day	8 wagon outturn/day
a)	A design office equipped with relevant computer hardware and softwares and competent personnel for handling the manufacturing drawings of wagons. Personnel should be able to fully understand the drawing, pinpoint deficiency and make changes, if required, make process sheets for manufacturing, make master list of parts, etc. The drawing office must be equipped with latest issues of all drawings and specifications (Railway, National and International) which may be required for manufacture of wagons in question.		Yes	Yes	Yes

8. Material Management Requirements:

S. No.	Requirement	Nature of Requirement	2 wagon outturn/day	4 wagon outturn/day	8 wagon outturn/day
a)	ERP implementation at the wagon builder must include all stages of stores/purchase activities including purchase, receipts and storage, consumption of raw materials, bought out items, consumables, documentation such as purchase orders, inspection certificate and test certificate.		Yes	Yes	Yes
b)	Ensure that a system exists for approval of vendors for bought-out item.	Mandatory	Yes	Yes	Yes
c)	A system to monitor that the items required to be purchased from RDSO approved sources are purchased from such sources only. Also, system of timely updation of list of RDSO approved sources should be in place.	Mandatory	Yes	Yes	Yes

e)	A computerized system should be available to monitor use of free supplied items and other major items such as bogies, coupler assemblies, wheel sets, etc., and it should be linked with wagon out-turn ground balance to exercise suitable control.		Yes	Yes	Yes

9. Laboratory Facilities

S. No.	Requirement	Nature of Requirement	2 wagon outturn/day	4 wagon outturn/day	8 wagon outturn/day
a)	Laboratory facilities for the following must be provided: i) Chemical Composition of Steel either by in house spectrometer or through a NABL approved source. ii) Universal testing machine iii) Hardness testers iv) Impact testing machine v) Digital/Dial elcometer min. 2 numbers for measuring thickness of paint. Lab faculties exiting in the proximity in any other unit of the same company can be used on a common basis All gauges & measuring instruments are to be calibrated periodically as per ISO norms.	Mandatory	Yes	Yes	Yes
b)	Radiographic Testing facility should be available either in house for which: i) Dark room facility shall be available. ii) Camera for Radiographic test shall be available. iii) Drying arrangement shall be available. iv) Inspecting staff conducting the radiographic testing is adequately trained and qualified by the	Mandatory	Yes	Yes	Yes

	appropriate agency and has adequate experience. Alternatively, there must be an arrangement with an authorized outside agency.				

10. Quality Assurance Requirements

S. No.	Requirement	Nature of Requirement	2 wagon outturn/day	4 wagon outturn/day	8 wagon outturn/day
a)	Periodicity of training of Engineers/Supervisor/Skilled Workers involved in Wagon manufacturing should be laid down, along-with syllabus and training place for each category. Implementation of prescribed training be monitored on Quarterly basis		Yes	Yes	Yes
b)	Welding Engineers should be requisite experience. Welding Supervisors should be qualified and certified by approved/ recognized welding institutes/ test houses. Role and duties of Welding Engineers and Welding supervisors should be clearly defined.		Yes	Yes	Yes
c)	All welders must be qualified and certified by approved/ recognized welding institute/test house as per requirements of IS: 7310.	Mandatory	Yes	Yes	Yes
d)	Ensure that a system exists to test the welders as per requirements of IS: 7310 and IS: 817 and proper records are maintained	Mandatory	Yes	Yes	Yes
e)	The training facilities to test the welders shall be available as specified in IS: 817. If such facilities do not exist inhouse training certificate from recognized training institute should be obtained.		Yes	Yes	Yes
f)	Quality Control Records must be maintained as per guidelines given in the latest issue of IRS: G-72.		Yes	Yes	Yes

g)	A well defined documented system of internal check of wagons including work in progress stage must be available.		Yes	Yes	Yes
h)	Wagon builder should have Quality Control Inspectors for internal check		Yes	Yes	Yes
i)	Record of inspections done by Quality Control Personnel, investigation done and corrective action taken should be well documented		Yes	Yes	Yes
j)	Customer complaint redressal system to be in place		Yes	Yes	Yes
k)	Outsourcing in Wagon Manufacturing Activities i) Wagon builder can outsource certain activities of wagon manufacturing, in following ways:- • Activities to be carried out in the premises of Wagon Builder- called Type "A" • Activities to be carried outside the premises of Wagon Builder- called Type "B" ii) For both types of outsourcing prior permission of RDSO, Lucknow is to be obtained Respective requirements laid down for M&P, Infrastructure, personnel, work methods for wagon manufacturing will have to be complied with for the outsourcing.		Yes	Yes	Yes
l)	Wagon builder should have proper system of settlement of warranty claims. Position in this regard should be readily available and it should be scrutinized periodically at the appropriate level.		Yes	Yes	Yes

11. Use of components like Bogie, Air Brake System, Couplers etc during wagon manufacturing

S. No.	Requirement	Nature of Requirement	2 wagon outturn/day	4 wagon outturn/day	8 wagon outturn/day
a)	During wagon manufacturing, provision of components like Bogie, Air Brake System, Couplers etc during wagon manufacturing shall be done as per extent instructions of Railway Board/RDSO on the subject. A record of procurement, fitment and traceability must be kept by the wagon manufacturer.	Mandatory	Yes	Yes	Yes
b)	In case a wagon builder is manufacturing simple wagon components for internal consumption, they need not be subjected to minimum order quantity (Part I /Part II vendor approval regime applicable to such components) for their own use provided they have obtained explicit approval of RDSO to manufacture such components. The list of such components will be decided by RDSO.				

भारत सरकार – रेल मंत्रालय
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Government of India - Ministry of Railways
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Organisation Lucknow – 226011
DID (0522) 2450115
DID (0522) 2465310

edwagonrdso@gmail.com

No. Dated:

M/s .....,
.....,
.....,
.....

Sub : Initial audit of your works at..... for compliance to G 105 Standard

Ref : 1)
2)

In terms of letters refereed at above and initial audit of your works at: ..... conducted on .....followed by follow up audit conducted on .....& .....the non conformities communicated vide this office letter no..... dated ..... & ..... are found to be adequately and satisfactorily addressed.

In view of the above, the Initial Audit of your works at: ..... for compliance to G 105 Standard is considered as completed.

Kindly advice your readiness for confirmatory audit within six months of issue of this letter.

(.....)
Executive Director Standards (Wagon)

Copy:

1. EDME (Freight), Railway Board, Rail Bhavan, New Delhi - 110001

Annexure V

GOVERNMENT OF INDIA – MINISTRY OF RAILWAYS
RESEARCH DESIGN & STANDARDS ORGANIZATION
MANAK NAGAR, LUCKNOW – 226 011
THIS CONFIRMS THAT

M/s..... WORKS AT: .....
HAS MET THE REQUIREMENTS OF INFRASTRUCTURE, MANUFACTURING, TESTING AND QUALITY ASSURANCE FOR MANUFACTURE OF RAILWAY WAGONS AS SPECIFICED IN THE STANDARD G 105 OF JUNE 2011

S. No.	Category	Manufacturing Capacity (Wagons/Annum)*
1	I (Open/Hopper/Flat/Well Wagons)	
2	II (Tank & Special Purpose Wagons)	
3	III (Covered Wagons)	

CERTIFICATE NUMBER: .....
CERTIFICATION DATE : .....
VALID TILL : .....

APPROVED: ----------
EXECUTIVE DIRECTOR STANDARDS (WAGON)

Note: * The overall capacity mentioned in the certificate is only indicative.