

1.0 INTRODUCTION

- 1.1 Production Units i.e. CLW, BLW and PLW under Ministry of Railways, Government of India, manufacturing of State of the Art Locomotives on Broad Gauge with speed potential upto 160 Kmph.
- 1.2 RDSO invites Expression of Interest (EOI) from experienced, capable, and certified independent quality assessment agencies for carrying out Quality Audit of newly manufactured or procured equipment and locomotives at the premises of Production Units i.e. CLW, BLW and PLW.

2.0 DEFINITIONS

Production Units mean PLW, CLW and BLW or any other unit advised by Ministry of Railways.

3.0 OBJECTIVES

- 3.1 This Document contains broad guidelines and expected outcome of the proposed EOI. Based on the outcome of this EOI, RDSO plans to shortlist potential Quality Audit Agencies for further processing in a transparent manner through tendering process to finalize an experienced and certified Quality Assessment Agency.

4.0 BENEFIT TO RESPONDENTS

- 4.1.1 The prospective bidders can understand the requirements properly which can help during participation in tendering process.
- 4.1.2 It will provide opportunity to take part in detailing of the scope of work.
- 4.2 Interested Firms/Organizations having experience and capability to meet with such requirements are requested to submit technical and other details in the prescribed format attached here with on or before 03.10.2024 to the address mentioned below. Details submitted after 03.10.2024 will not be considered as part of response of this EOI. Respondents can send their response by e-mail or Hard Copy by mail or else can submit physically at the below address. In case 03.10.2024 falls on a holiday, the response can be submitted on the next working day.

**Principal Executive Director Standard/PS&EMU,
Annexee-I, Electrical Directorate, RDSO
Manak Nagar, Lucknow-226011
Email: pedpsemurdso@gmail.com**

Time for submission - By e-mail upto 23:59 hrs of 03.10.2024

Physical handingover: Upto 17:30 Hrs on 03.10.2024.

By Post: So as to reach the above specified address by 17.30 hrs of 03/10/2024

Bidders shall check RDSO website for any changes or corrigendum issued for this document. The URL for RDSO website hosting this EOI is:

<https://rdso.indianrailways.gov.in>

Please check this space for any updates.

5.0 INSTRUCTIONS TO RESPONDENTS

- 5.1 This current document is an Expression of Interest (EOI) published by the RDSO of Indian Railways to solicit and examine the response of the firms/companies/entities that are capable of conducting a quality audit of newly manufactured or procured equipment and locomotives as per the details mentioned in this document before Indian Railways finalizes the specification and associated conditions for the proposed work for Invitation of bids. The current document is therefore to explore the response from the prospective respondents.
- 5.2 Final specifications and conditions of contract shall be made after going through the response and comments of the respondents, in response to this document. Invitation for Bids shall be called for after the specifications are finalized by RDSO, Ministry of Railways, Government of India.
- 5.3 Some of the operational conditions of contract are briefly mentioned in this document for guidance of the respondents. These are subject to change based on the examination of response received and in line with the Indian Railways Standard Conditions of Contract.
- 5.4 The terms and conditions mentioned in this document are subject to change and shall be firmed up while bids are called for by RDSO at a later date.
- 5.5 However, it may please be noted that the decision of RDSO shall be final while addressing the issues raised by respondents in response to this document.
- 5.6 RDSO may change any or all of the terms and conditions and/or technical, commercial or operating requirements in their final document from the ones, which are specified in the current Expression of Interest. The revised set of conditions and specifications that shall then be part of final Invitation for Bid Document will be published at the time of calling for bids.
- 5.7 Firms are free to respond for this work as a single entity or as a consortium of Companies, one of which must own the offered expertise. In case of consortium, the primary responsibility of executing the project shall be of the majority stake holder.
- 5.8 RDSO invites response to this EOI and preliminary proposals from such firms/entities specifying basic details as per but not limited to the points mentioned in this EOI documents.

6.0 ELIGIBILITY CRITERIA

- 6.1 Bidder(s) shall be certified independent Quality Assessment Agency having proven experience and capability in **“Railway Rolling Stock (Locomotives) Design or Quality Audit of Railway Rolling stock for Locomotives in India/outside India with successful completion record”**.
- 6.2 Bidder(s) shall meet the criteria as under and shall apply in the prescribed application form with budgetary quotations in sealed envelopes.
- i. The bidder can be a single entity or Consortium or JV.
 - ii. If the bidder is not from India, it shall have a tie-up or consortium or JV with an Indian Entity having experience in field of Railway Rolling Stock Design or Design of electrical systems of Rolling stock or having experience of Quality audit of electrical; systems of Railway Rolling stock.
 - iii. Bidders must have experience in the field of Railway Rolling Stock (Locomotives) Design or Quality Audit of electrical systems of railway rolling stock for Locomotives

and should have completed One "Rolling Stock Design or Quality Audit of Electrical systems of Railway Rolling stock locomotives "in last five Financial Years.

- iv. Firm shall have Financial Capacity to complete the Audit and shall submit the details of the turnover for the last three Financial Years.
- v. Firm shall submit past performance in support of the Design/Audit and Assessment, of Railway Rolling stock(locomotives). The details shall include list of personnel along with their experience details etc.
- vi. Certification: The bidder must be ISO 9001 certified and must also be accredited as an inspection body according to ISO/IEC 17020 (latest) or any other international certification for fire safety of electrical equipment in locomotives.

7.0 SCOPE OF WORK

- 7.1 Production Units are manufacturing multiple variants of locomotives. Summary of various regular locomotives variants being manufactured along with their layout drawings are as under:

S.No.	Types of Locomotive	Layout Drawing No.
1.	WAG9	SKEL- 4357
2.	WAG9H	SKEL- 4547
	WAG9HC	SKEL- 5041
3.	WAP7	SKEL- 4490
4.	WAP5	SKEL-4353

All design and validation activities for these locomotives are undertaken by Production Units in consultation with Research, Design and Standards Organization(RDSO,LKO) of Indian Railways.

- 7.2 The scope of work includes comprehensive Quality Audit of all above locomotive variants and newly manufactured or procured equipment covering following activities:
- a. Sample Quality check of incoming Raw Material/equipments
 - b. Inprocess quality check
 - c. Quality check of final items:
 - Electrical items
 - Mechanical items
 - d. Manufacturing Practices
 - e. Acceptance Parameters
 - f. Testing Methods of Electrical and Mechanical systems
 - g. Quality audit of Any other system related to Locomotive

- 7.3 Deliverables:

- a. Quality audit reports of sample of raw material/equipment
- b. Quality check report of Cabling and Harnessing
- c. Quality check report of manufacturing practices
- d. Quality check report of major items of Locomotives
- e. Review of acceptance parameters during manufacturing and testing at locomotives level
- f. Shortcomings and recommendations for improvement
- g. Quality audit of complete Locomotive

For inspection of all stages comprising of visual and dimensional check of component and sub-assemblies in respect of alignment, fitment, quality and workmanship. Proper testing of Brake System, Electrical, Mechanical System, Rain Water Testing of Locomotive, Fire and Smoke detection system working in Locomotive.

The reviews and recommendations shall be based on applicable RDSO code (s) of practice and other relevant National/International Standards applicable for Rolling stock design with clear reference to specific clauses of existing design/process documents and applicable standards. The practices being followed by reputed rolling stock manufacturers supported by authentic documentation may also be referred in the audit report.

Deliverables include submitting detailed simulation reports supporting the recommendations to improve existing design and manufacturing practices. For further improvement and system augmentation, firm shall also recommend requirement of additional design tools/software packages, manufacturing tools and test equipment, etc.

Audit report and related documents along with calculations, models, validations, analysis, simulation, conclusion etc. shall be submitted to purchaser for approval.

8.0 GENERAL FEATURES OF 3-PHASE ELECTRIC LOCOMOTIVES

8.1 Description of the system

25 KV OHE feed to transformer of three phase loco through panto and VCB. The main transformer converts the overhead line voltage (25 kV) to the lower operating voltages. There are four secondary traction windings (two on each converter unit, 1269 V), one for feeding the auxiliary circuits (1000 V) and one for the harmonic filter. The power from transformer secondary goes to line converter. The line converter (NSR) converts the constant frequency AC voltage supplied by the transformer into DC voltage (intermediate link). DC link store the High DC voltage for converting three phase AC. The drive converter (ASR) generates a 3-phase system with variable voltage and frequency from taking DC voltage from DC link. The energy flow is reversed during regenerative braking. Formerly GTO based converter is used but nowadays IGBT based is extensively used in three phase technology. The power elements of the converter unit (line converter, drive converter) are oil-cooled. When braking applied electrically, the traction motors act as generators. In the converter- the resulting three-phase electrical energy is converted into single-phase energy which is fed back into the OHE. Output voltage of the Traction Converter 2180 V, Output current 831 A, Output power 2365 kW. In a word, single phase AC supply (OHE) fed in main transformer and it converted DC by line converter (NSR) and store in DC link, thereafter, three phase voltage is produced by drive converter (ASR) from DC source for supplying three phase traction motors of locomotive.

8.3 The details of the Items/equipment provided in the Production Units built locomotives are as under:

8.3.1 Electrical Item/Equipment

S.No.	Items	Specifications/Drawing
1.	All Relays	As per latest drawing

QUALITY AUDIT OF NEWLY MANUFACTURED OR PROCURED EQUIPMENT AND LOCOMOTIVES

EOI: EL/RDSO/EOI/LOCO/001/2024

2.	Pantograph mounting Insulators	CLW/ES/AC/1-1/1, CLW/ES/SK- 4/AC/1-1/1
3.	Roofline Insulators	CLW/ES/AC/1-1/1, CLW/ES/SK- 2/AC/1-1/1
4.	Surge arrestors	CLW/ES/3/0016
5.	VCB	CLW/ES/C-47/H
6.	High voltage cable with plug	CLW/ES/3/0251(Rev 1 December 06)
7.	Main Transformer	CLW/ES/3/0456
8.	Traction converter	CLW/ES/3/0001
9.	Auxiliary converter	CLW/ES/3/0002
10.	DC-DC Converter	ELRS/SPEC/DC-DC converter/0021 (Rev.1)
11.	Hotel load converter	CLW/ES/3/IGBT/0490 Alt 0, Rev.1
12.	Traction motor	4TMS.096.069 Alt.5 dtd 26.04.2012 or latest
13.	Traction motor blower including motor	CLW/ES/3/0019/G, SPEC/E-10/3/09 with amendment nos. 01,02,03,04 & 05
14.	Scavenge blower to Tm/Oil Cooling unit including motor	CLW/ES/3/0021/G, SPEC/E-10/3/09 with amendment nos. 01,02,03,04 & 05
15.	Scavenge blower to Mr Blower including motor	CLW/ES/3/0022/F, SPEC/E-10/3/09 with amendment nos. 01,02,03,04 & 05
16.	Machine room blower including motor	CLW/ES/3/0020/F, SPEC/E-10/3/09 with amendment nos. 01,02,03,04 & 05
17.	Main Compressor with mounting accessories along with motor	CLW/ES/3/0100/E, SPEC/E-10/3/09 with amendment nos. 01,02,03,04 & 05
18.	Air Compressor(Auxiliary compressor)	CLW/ES/3/0197 Alt-1
19.	Horn	MP.0.99.00.04 Nov 1990
20.	Servo Motor	GSEC/Panto/141,142,143,144
21.	Speedometer	
22.	Set of Fibre Optics cable	CLW/ES/3/0141
23.	Master Controller	CLW/ES/3/0031/I
24.	Oil cooler radiator for converter/Transformer cooling	CLW/ES/3/0102/E
25.	Auxiliary compressor	CLW/ES/C-4/F
26.	Microprocessor based electronic speed indicating, recording system & 01 evaluation software for every 10 sets of SPM	ELRS/SPEC/SPM/002(Rev.2), June 2004 with amendment no.01 to 06
27.	Primary Voltage Transformer	CLW/ES/3/0009/B
28.	Primary Current Transformer	CLW/ES/3/0013/B
29.	Primary Current Sensor	CLW/ES/3/0084/A
30.	Temperature Sensor Oil Circuit Transformer	CLW/ES/3/0033G
31.	Driver Display Unit	CLW/ES/3/0487/C
32.	Illumination pneumatic Gauges	CLW/ES/3/0111/A
33.	Resistor to Primary Current Transformer	CLW/ES/3/0014/E
34.	Cab heater/Ventilation assly	CLW/ES/3/0109/F
35.	Oil Pump Transformer along with Motor	CLW/ES/3/0106/E, SPEC/E-10/3/09 with amendment nos. 01,02,03,04 & 05
36.	Blower for oil cooling unit with	CLW/ES/3/0647/E, SPEC/E-10/3/09 with

QUALITY AUDIT OF NEWLY MANUFACTURED OR PROCURED EQUIPMENT AND LOCOMOTIVES

EOI: EL/RDSO/EOI/LOCO/001/2024

	casing	amendment nos. 01,02,03,04 & 05
37.	High Reach Pantograph	RDSO/2007/EL/SPEC.0054, Rev.'1'
38.	Roof Mounted Air Conditioning System without "Trough"	RDSO/2007/EL/SPEC.0055, Rev.'1'
39.	All types of cables	From RDSO approved sources
40.	IGBT based propulsion system	RDSO/2008/EL/SPEC.0071, Rev.'5 or latest'

8.3.2 Mechanical and Pneumatic Item/Equipment

S.No.	Items	ABB Drg./CLW Drg./Specifications No.
1.	Elastic ring	RDSO/2007/EL/SPEC/0053 (Rev.2) June 2021 amendment No. 01 dt. 30.07.2010
2.	Traction link	RDSO/2023/EL/MS/0493(Rev.0) CLW/2016/ELDO/M/STR/0041
3.	Axle Box Complete With CRU-150	CLW/MS/3/003 Alt.5
4.	Axle	1209-01.311-054
5.	Wheels	1209-01.111-008 Alt-4
6.	TM mounting lug	1209-01-412-186 & 187
7.	Twin beam LED Light	RDSO/2017/EL/SPEC/0134(Rev.3)
8.	LED Marker light	i)ELRS/SPEC/PR/0022(Rev.1,Oct 2004) except page no.24 ii) CLW/ES/SK-1/L-29 ALT-A
9.	LED based Flasher light	i)ELRS/SPEC/LFL/0017(Rev.1 Sept 2004) ii) CLW/ES/SK-3/L-21/C
10.	Motorised Bogie Complete Locomotive	CLW/MS/3/SPEC/ELDO- Bogie /001 March 2013
11.	Housing and pivot pin assembly of 3 phase locomotives	1209-01.311-002
12.	Water less urinal	RDSO/2023/EL/FRS/0034(Rev.0)
13.	Spheriblocs	RDSO/2007/EL/SPEC/0051 (Rev. 2)
14.	Gear & Pinion	MP.0.2800.19 (Rev.0) OCT 2005
	Bull Gear(107 Teeth)	SK DP-3848
	Pinon (21 Teeth)	SK DP-3847
15.	High Capacity Draft Gear (Fitment Suitable As per General Arrgt. Drg. No. SKDL-3430)	RDSO's Specn No. 56-BD-08
16.	Gear Case Complete	1209-01.013-014 Alt.-7
17.	Gear case bearing Main Gear bearing Intermediate bearing Pinion bearing	1210-01.311-021 1210-01.411-022 1210-01.411-023
18.	MSU	CLW/MS/3/201 Alt 2, CLW/MS/3/049 Alt 4, CLW/MS/3/052 Alt 8
19.	MSU bearing	RDSO/EL/FRS/Bearing/0013-2015 Rev.0
20.	Dampers	CLW/MS/3/009 Alt. 3
21.	Brake rigging and associated	1209-01.116-059

QUALITY AUDIT OF NEWLY MANUFACTURED OR PROCURED EQUIPMENT AND LOCOMOTIVES

EOI: EL/RDSO/EOI/LOCO/001/2024

	component	
22.	Axle box bearing	IA 011-00379
23.	Side Buffer Assly.	RDSO Drg. No. SK.DL-4748 Alt nil and SPEC No. MP-0.41.00.03 (Rev.01) August 2005
24.	Axle guide	IB016-00380
25.	Sander	IB011-00245
26.	Driver's seat	CLW/MS/3/021 Alt.6
27.	Hand brake	MP.0.01.00.35 Rev.0 July 2021
28.	Brake block	MP.0.01.00.04 Rev.10 Mar 2021
29.	Traction motor bearings	RDSO/EL/FRS/Bearing/0012-2015 Rev.0
30.	Auxiliary motor bearing	
31.	Brake system	CLW/MS/3/001 Alt.-13 or Latest
32.	Holder For Tm Suspension	1209-01.118-002 Alt.2
33.	Wheel Set Guide	1209-01.115-004 Alt.-1
34.	Filter Assy.	CLW/MS/3/012 Alt.5
35.	Windows For WAG/9H	CLW/MS/3/014 Alt.5
36.	Wind Screen Assy.	CLW/MS/3/027 Alt.6
37.	Blind Installation (L.H. & R.H.)	CLW/MS/3/035 Alt.3
38.	Battery Box Complete & General Arrangement of Battery Box Assy.	CLW/MS/3/037 Alt.8
39.	Suspension Tube Complete	CLW/MS/3/052 Alt.7
40.	Modified Cow Catcher Assy.	CLW/MS/3/107 Alt.6
41.	Cab Side Door For G/9h,P17, Locos.	CLW/MS/3/013 Revision 1 Dec.06 Alt.- 8
42.	M/C Room Door For WAG/9H	CLW/MS/3/013 Revision 1 Dec.06 Alt.- 3
43.	Helical Springs For WAG-9H	CLW/MS/3/SPEC./ELDOBOGIE/004
44.	Fire Extinguishing System 22.5 Kg. CO2 With Accessories (Consisting of 15 Items)	CLW/MS/3/108 Alt.6
45.	High Tensile Transition C.B. Coupler Without Draft Gear As Per RDSO Drg. No. SK-DL-3430. Alt.-8 or Latest Except Item Nos. 18 to 20, 24 to 47 along with Part Drg. Nos. SK-62724 ALT-23 or Latest , SKDL-2496 Alt.-6 or Latest, SK-62724 ALT-69508 Alt.- 4 or Latest , SKDL-2494 Alt.-17 or Latest and SKDL-2495 Alt.-12 or Latest.	RDSO's Spec No. 56-BD-07 M.A.No. 1 or Latest
46.	Transition Screw Coupling For CBC (Fitment Suitable as per general arrangement Drg. No. SK.DL-3430	SK.DL-2494 Alt.17
47.	Complete Shell Assly. For WAG- 9H	CLW/MS/3/152 Alt.-4
48.	Roof Hatch Retainer Assly.	
	Roof Hatch Retainer Assly Intermediate	1209-10.237-051
	Retainer Bolt	1209-10.437-055

	Roof Hatch Retainer Assly (End)	1209-10.337-077
	Retainer Bolt	1209-10.337.054
49.	S/s/Pipe Fitting For Shell Piping (WAG-9H) For E-70 Brake System	CLW/MS/3/053 Alt. 20
50.	Copper Pipe Fitting	CLW/MS/3/067 Alt. 4
51.	Steel Pipe Fitting For E-70 Brake System	CLW/MS/3/068 Alt. 14
52.	S/S/Pipe Fitting For Shell Piping (WAG-9H) For CCB System	CLW/MS/3/053 Alt. 20
53.	Brass Pipe Fitting For CCB System of WAG-9H and WAP-7	CLW/TS/99/CF/5 Alt.8
54.	Steel Pipe Fitting For Brake System	CLW/MS/3/068 Alt. 14
55.	Steel Pipe Fitting For Bogie Piping of WAG 9/WAH 9H	CLW/MS/3/068 Alt. 14
56.	Tread Brake Arrangement Compt. For WAG-9H	CLW/MS/3/007 Alt.-1
57.	Brake Control System Including Drivers Vigilance Control Device for WAG-9 & WAP-7 Class of Locomotive	CLW/MS/3/001 Alt.-15
58.	T.T. Air Dryer	M.P.01.00.06 Rev.05 March 2011
59.	Wiper Assy. Compl.	CLW/MS/3/050 Alt.-6

9.0 TENDER CONDITIONS

- a. Detailed tender will be floated by RDSO detailing all requirements based on the outcome of EOI.
- b. Payment structure and all the tender conditions will be part of the Tender document which will be floated by RDSO based on the inputs received in the tender.
- c. Public Procurement (Preference to Make in India), Order 2017 norms will be applicable for the tender.

10.0 Documents to be submitted by the Respondents against EOI

- a. Proposed suggestions to the Scope of Work.
- b. Budgetary quote for the proposed scope of work in a sealed cover. Budgetary Quote will invariably be submitted locomotives variant wise and other newly manufactured or procured equipment wise separately.
- c. Experience and qualifications in relevant areas
- d. Proposed approach and methodology for the project
- e. Team expertise and resources
- f. Project timelines
- g. Proven examples of successful performance, audit and implementation of similar projects
- h. Technical Presentation/ Documentation on the proposed Audit
- i. Credentials of the Respondent as per Annexure-II
- j. Audited financial statements for the last three years.
- k. Filled and signed Covering letter as per Annexure-I

QUALITY AUDIT OF NEWLY MANUFACTURED OR PROCURED EQUIPMENT AND LOCOMOTIVES

EOI: EL/RDSO/EOI/LOCO/001/2024

- l. Remarks on EOI including suggestions/modifications- RDSO rights to consider, modify, and reject such suggestions.
- m. All documents shall be in English. For documents in other language, English translation shall be submitted.

11.0 Timelines

- a. Receiving of Offers-03rd October, 2024
- b. Audit Work-2 Months from the date of Letter of Acceptance (For this separate tender will be floated)

12.0 REFERENCE SPECIFICATIONS

All reference specifications are available on respective official websites of Production Units and RDSO, Lucknow.

ANNEXURE-1

**FORMAT FOR COVERING LETTER
(TO BE SUBMITTED ON COMPANY'S LETTER HEAD)**

To

**Principal Executive Director Standard/PS&EMU,
Annexee-I, Electrical Directorate, RDSO
Manak Nagar, Lucknow-226011
Email:pedpsemurdso@gmail.com**

Sub: Submission of Expression of Interest (EOI) for carrying out Quality Audit and Inspection of Three Phase Locomotives.

I / We ----- do hereby declare that the information given in this application, documents enclosed are true to the best of my knowledge and belief

I / We undertake that I have full authority to submit this EOI document along with the documents enclosed, on behalf of (name of the company)

I / We hereby understand that the submission of responses/offers/ bids does not guarantee award of work for carrying out the Quality Audit and Inspection of Three Phase Locomotives

I / We Understand that

1. This EOI for finalization of the technical specification for carrying out the quality audit of newly manufactured or procured equipment and locomotives.
2. RDSO may float a separate Tender (based on their requirement) with all conditions like Eligibility Criteria defines and participation in EOI doesn't guarantee any qualification of the Tender
3. RDSO is free to initiate different mode/method for appointment of activities/services/ including, but not limited to, those not covered in the scope of this for which RDSO feels other mode of appointment are better suited.

Date-----

(Signature of Applicant with Name and Designation)

ANNEXURE-II

S.No.	Details	Details to be submitted along with documents
1.	<p>The Consultant can be a single entity or Consortium or JV.</p> <p>If the consultant is not from India, they shall have a Tie-up or Consortium or JV with an Indian Entity having experience in Audit of similar Rolling Stock infra.</p>	<p>Please submit details of the bidding entity. In case of Planned consortium, a Joint signed letter by all the entities will suffice for the Purpose of EOI.</p>
2.	<p>Bidders must have experience in the in the field Railway Rolling stock (Locomotives) design/ Quality audit of Railway Rolling stock (locomotives) and should have completed one "Rolling stock design or Quality audit of Electrical Systems of Railway Rolling stock for Locomotives" in last 5 financial years.</p>	<p>Documents in support of Project Completion. Credentials in form of Completion Certificate or details which can support the claim of proven experience shall be submitted.</p>
3.	<p>Firm shall have financial capacity to complete the project. Firm shall submit the details of turnover of the last three financial years.</p>	<p>Please submit details of Last three years</p>
4.	<p>ISO certificates</p>	<p>ISO 9001, ISO/IEC 17020 (latest) on national/international certifications for fire safety of Electrical Equipment in Railway Locomotives.</p>