



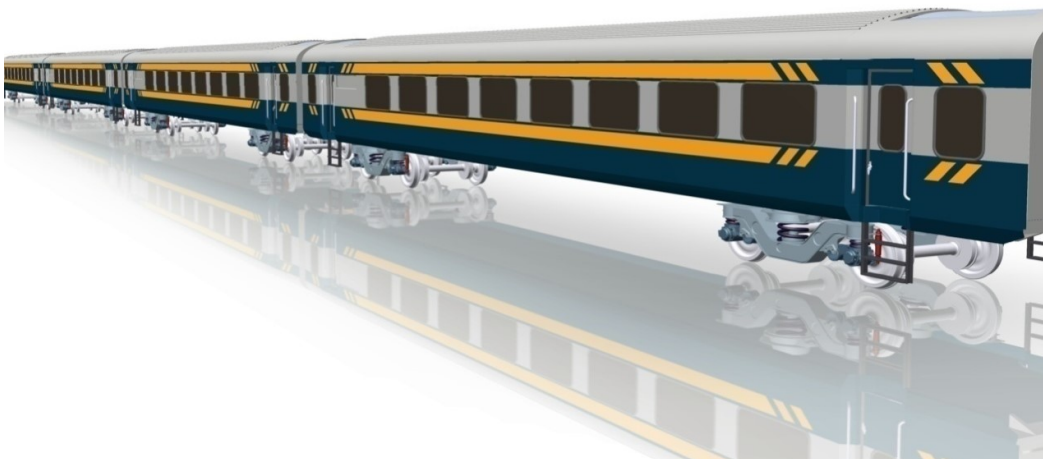
**GOVERNMENT OF INDIA
MINISTRY OF RAILWAYS**

**CALL FOR
EXPRESSION OF INTEREST (EOI)**

EOI:RCF/LHB/EOI/005/2024

**FOR
SAFETY AUDIT OF ELECTRICAL SYSTEMS IN LHB COACHES**

**RAIL COACH FACTORY
KAPURTHALA-144602**



Issued by:
Sukhbir Singh
Dy.CEE/DP/RCF

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1. **Introduction**

1.1. Rail Coach Factory, Kapurthala (RCF) is a Coach Production Unit under Ministry of Railways, Government of India, manufacturing State of the Art LHB coaches under TOT from Alstom Germany on Broad gauge with speed potential of 160 Kmph.

1.2. RCF invites Expression of Interest (EOI) from experienced, capable, and certified independent safety assessment agencies for carrying out **“Safety audit of the Electrical Systems in LHB coaches as per scope of the work.”**

1.3. **OBJECTIVES**

1.3.1. This Document contains broad guidelines and expected outcome of the proposed EOI. Based on the outcome of this EOI, RCF plans to short list potential safety audit agencies for further processing in a transparent manner through tendering process to finalize an experienced and certified safety assessment Agency

1.4. **Benefit to Respondents**

1.4.1. The prospective bidders can understand the requirements properly which can help during participation in tendering process.

1.4.2. Will provide opportunity to take part in detailing of the scope of work.

1.5. 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 20.08.2024 to the address mentioned below. Details submitted after 20-08-2024 will not be considered as part of response of this EOI. Respondents can send their response by Email or Hard copy by Mail or else can submit physically at the below address. In case 20th August 2024 falls on a holiday, the response can be submitted on the next working day.

**Chief Electrical Design Engineer,
Office of Principal Chief Electrical Engineer,
Administrative Building
Rail Coach Factory, Kapurthala-144602
Email: cederacf@gmail.com**

Time for submission – By Email upto 23:59 hrs of 20.08.2024;

Physical handing over: Upto 17:30 Hrs of 20.08.2024.

By Post : So as to reach the above specified address by 17.30 hrs of 20/08/2024

Bidders shall check RCF website for any changes or corrigendum issued for this document. The URL for RCF website hosting this EOI is:
https://rcf.indianrailways.gov.in/view_section.jsp?lang=0&id=0,299,554

Please check this space for any updates.



2. Instructions to Respondents

- 2.1. This current document is an Expression of Interest (EOI) published by the Indian Railways (RCF) to solicit and examine the response of the firms/companies/entities that are capable of conducting a safety audit for the Railway Rolling stock as per the details mentioned in this document before Indian Railways finalizes the specifications and associated conditions for the proposed work for Invitation of bids. The current document is therefore to explore the response from the prospective Respondents.
- 2.2. 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 RCF, Ministry of Railways, Government of India.
- 2.3. 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.
- 2.4. The terms and conditions mentioned in this document are subject to change and shall be firmed up while bids are called for by RCF, Kapurthala at a later date.
- 2.5. However, it may please be noted that the decision of RCF, Kapurthala shall be final while addressing the issues raised by respondents in response to this document.
- 2.6. RCF, Kapurthala 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.
- 2.7. 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.
- 2.8. RCF, Kapurthala 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.

3. Eligibility Criteria

- 3.1. Bidder(s) shall be certified independent safety assessment agency having proven experience and capability in Railway Rolling stock (Passenger Coaches) design/ Safety Audit of Electrical Systems of Railway Rolling stock (Passenger Coaches) in India or outside India with Successful completion record.
- 3.2. 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 safety audit of electrical systems of Railway Rolling stock.
- iii. Bidders must have experience in the field of Railway Rolling stock (Passenger Coaches) design/ Safety Audit of Electrical Systems of Railway Rolling stock (Passenger Coaches) and should have completed one " **Rolling stock design or safety audit of electrical systems of railway rolling stock for passenger coaches** " in last 5 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 (passenger coaches). 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 Equipments in Railway Passenger Coaches.

4. SCOPE OF WORK

- i) RCF is manufacturing multiple variants of LHB type AC and Non-AC coaches for working in End-on Generation (EOG) system and are also compatible for working in Head-on Generation mode. Summary of various regular LHB Coach variants being manufactured along with their layout drawings are as under:

Sno	Type of coach	Layout drawing no.
1	Power Car	LP90030
2	AC 2 TIER	LW90060 Alt 'b'
3	AC 3 TIER	LE90073 Alt 'b'
4	First AC	LA90034 Alt 'b'
5	AC 3 TIER ECONOMY	LE90050
6	AC CHAIR CAR	LZ90031
7	EXECUTIVE AC CHAIR CAR	LZ90003
8	AC HOT BUFFET	LH90016 Alt 'a'
9	SLRD (LUGGAGE CUM BRAKE VAN WITH PASSENGERS)	LR90036
10	NON-AC GENERAL	LG90029
11	NON-AC SLEEPER	LS90018
12	NON-AC CHAIR CAR	LJ90015
13	DOUBLE DECKER AC COACH	LD90009
14	AC GENERAL CLASS	LG90043

All design and validation activities for these Coaches are undertaken by RCF, Kapurthala in consultation with research and design organization of Indian Railways i.e. Research, Design and Standards Organization (RDSO) Lucknow.

- ii) The scope of work includes comprehensive safety audit of all above variants and their sub-variants of LHB Coaches covering following activities:
 - a) Electrical Circuit design
 - b) Cabling and Harnessing
 - c) Manufacturing practices
 - d) Acceptance parameters
 - e) Testing methods of electrical circuits and its components
 - f) Any other related Electrical safety issues
- iii) Deliverables:
 - a) Complete review of Electrical scheme in all Coach variants
 - b) Review of Rake level and Coach level Protection scheme
 - c) Review of procedures for design validation
 - d) Review of Cabling and Harnessing
 - e) Review of manufacturing practices
 - f) Review of acceptance parameters during manufacturing and testing at Coach level
 - g) Review of acceptance parameters in Coach Electrics specifications
 - h) Testing methods for Electrical circuits and its components
 - i) Shortcomings and recommendations for improvement

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. RDSO shall also be actively associated during the entire process of audit.

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, conclusion etc. shall be submitted to purchaser for approval.

5 GENERAL FEATURES OF LHB COACHES

Description of the system

The coaches are designed to work on the End-on-Generation (EOG) system of power supply to RDSO Code of Practice to specification no. ELPS/SPEC/EOG/01 i.e. power supply for the whole rake of the train formation is taken from Power cars attached at both ends. The power car is equipped with 2 x 500 kVA DG Sets with electrical power at 750 volts, 3 phase 50 Hz transmitted to the whole rake. The supply from OHE (Overhead Equipment) is also available through 2x500 kVA converters installed in the Locomotives for HOG (Head-on Generation) system of supply. The neutral point of the generator is earthed in the power car itself.

Electrical power is transmitted through two feeder lines (Train Bus bar). To control the two feeders, feeder control panel to RCF specification no EDTS103 is provided such that each feeder feeds power individually and one DG set can supply power to both the feeders. The protective devices for feeders provided inside the Power Panel (SBC) are

- Earth leakage
- Overload / short circuit

The 750 volts, 3 phase 50Hz input supply is stepped down to 415 volts, 3 phase, 50 Hz by a step-down transformer for feeding the load of RMPU (Coach AC units), Pump equipment and Exhaust system at 415 volts 3 phase and other loads at 230 volts. 415 v supply is further stepped down to 110 v supply for further distribution inside the Coach for use in Mobile Charging sockets etc.

Provision of 70/120 Ah VRLA Battery set is also made along with its Battery Charger and associated protection equipment for distribution inside the Coach for LED lighting, BLDC Fans, CCTV, Fire detection system etc.

The net installed capacity of the generating equipment is 2 x 500 kVA at 750 volts, 3 phase 4-wire system. In HOG system, 3 phase, 3 wire system is utilized. The equipment provided in the power cars is as per Annexure-B.

Wiring in the superstructure of the coach is done in non-metallic rigid conduits to IS:9537(pt-3).

Each Coach has its own Electrical Panel housing all control and protection switchgears.

POWER TRANSMISSION:**i) Train Bus-bar.**

The power generated in the power cars at the end of the rake is transmitted to the entire rake through two train bus-bars (feeders) connected to the inter-vehicular coupler plug & socket. There are two independent train bus-bars connected with feeder line control panel. The train bus-bar consists of 7 (Seven) cables:

- a) R, Y, B- 150 Sqmm
- b) Neutral – 95 Sqmm
- c) Earth – 70 Sqmm
- d) Control cables C1 & C2- 2.5 Sqmm

The train bus-bar cables are laid in Aluminum conduits in under frame rigidly clamped.

ii) Inter - Vehicular Coupler:

Each coach is electrically coupled by means of 500 amps, 3 Phase, 750 volts, 50 Hz Inter-vehicular couplers consisting of plug, socket and jumper cables to RDSO specification no RDSO/PE/SPEC/AC/0177. The jumper cables consist of cables as indicated above.

iii) Cables

All cables are thin-walled cross-linked polyethylene insulation, flame retardant, low and non-toxic smoke, flexible stranded copper conductor of suitable size & rating for adequate voltage grade, suitable for use in Rolling Stocks conforming to RDSO specification no ELRS/SPEC/ELC/0019.

iv) AIR-CONDITIONING EQUIPMENT:

The AC coaches are provided with 2 (Two) number of microprocessor controlled/ PLC controlled Roof-Mounted Modular Package Type Air Conditioning Units with all accessories to RDSO specification no RDSO/PE/SPEC/AC/0061.

v) HOG Supply/DG set in Power Car: -

Diesel Generating sets of 500 kVA, 3-phase, 750 volts, 50 Hz capacity to RDSO specification no RDSO/PE/SPEC/AC/084 are provided in the Power cars to cater to the Rake Load. With the development of HOG system 3-phase, 750 volts hotel load is available from electric and diesel locomotives. Interlocking is provided between the HOG supply from the locomotive and the DG Set supply as per RDSO modification sheet no RDSO/PE/MS/0051-2011(Rev-2).

vi) Carriage Fans:

BLDC Fans are provided in all LHB Non-AC Coaches to RDSO Specification RDSO/PE/SPEC/TL/0021-2005 Rev-3, Amdt-1. RCF ann-1.

vii) The details of the electrical equipment provided in the RCF built coaches is as under:

Sno	Items	Specification	LHB AC 2T	LHB AC 3T	LHB AC BUFFET	LHB NAC	POWER CAR	LSLRD
1	12 V, 70 Ah VRLA Battery	RDSO/PE/SPEC/AC/0009-2014, Rev -2	*	*	*			*
2	120 Ah VRLA Battery					*		*
3	24v Starter Battery Charger For 500 kVA DA Set	EDTS106 REV-NIL Amdt1-2, Corr-1					*	
4	4.5 kW Under-slung Constant Regulator Battery Charger		*	*	*	*	*	*
5	60 Kva Transformer	RDSO/PE/SPEC/AC/0080 REV-2	*	*	*	*	*	
6	9/15 Kva Transformer	RDSO/PE/SPEC/TL/0158 Rev-Nil				*		*
7	Brushless DC Fan	RDSO/PE/SPEC/TL/0021-2005 Rev-3, Amdt-1. RCF ann-1				*		*
8	Cable Harness	Relevant RCF Specification	*	*	*	*	*	*
9	Cable management system	RDSO/PE/SPEC/AC/0138-2009, REV-1	*	*	*	*	*	*
10	Crimping Socket	EDTS201	*	*	*	*	*	*
11	Emergency Lighting System For EOG Type LHB Coaches	RDSO/PE/SPEC/0180-2016, Rev-0, TY-II	*	*	*	*		*
12	Feeder Junction Box For Power Car	EDTS328 REV-C AMDT-5 CORR-1&2 TY-II	*	*	*	*	*	*
13	Jumper Cable With Connector To Drg. No. Lw75206 Alt 'A'	LW75206 Alt 'd'	*	*	*		*	*
14	LED Light Fitting	RDSO/PE/SPEC/TL/0091-2016, Rev-1, RCF Ann-1,2,3	*			*	*	*
15	LED Light Fitting Berth Reading Light		*					
16	Modular Pantry	EDTS118			*			
		EDTS139	*	*				
17	Set of Panels	EDTS355				*		*
18	Switch Board Cabinet For LHB AC Hot Buffet Coach	EDTS134			*			

19	Switch Board Cabinet For LHB Power Car	EDTS103					*	
20	Switch Board Cabinet For LHB AC Coaches	RDSO/PE/SPEC/AC/0184	*	*			*	
21	Switch Board Cabinet For LSLRD Coaches	RDSO/PE/SPEC/AC/0195						*
22	Wheel Set Earthing Equipment	EDTS101 REV-C, Amdt-1 Corr-6 Ann-1	*	*	*	*	*	*
23	Diesel Alternator Set	RDSO/PE/SPEC/AC/0084					*	
24	Roof Mounted AC package unit	RDSO/PE/SPEC/AC/0061	*	*	*		*	

*- Indicates provision of equipment in the respective Coaches.

6 Tender Conditions

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

7 Documents to be Submitted by the Respondents against EOI

- Proposed suggestions to the Scope of work.
- Budgetary quote for the proposed scope of work in a sealed cover. Budgetary Quote will invariably be submitted coach variant wise.
- Experience and qualifications in relevant areas
- Proposed approach and methodology for the project
- Team expertise and resources
- Project time lines
- Proven examples of successful audit and implementation of similar projects
- Technical Presentation / Documentation on the proposed Audit
- Credentials of the Respondent as per Annexure-II
- Audited financial statements for the last three years.
- Filled and signed Covering letter as per Annexure-I
- Remarks on EOI including suggestions / modifications -RCF reserve all the rights to consider, modify, and reject such suggestions.
- All documents shall be in English. For documents in other language, English translation shall be submitted.

8 Timelines

- Receiving of Offers - 20th August, 2024
- Audit Work - 2 Months from the date of Letter of Acceptance (For this separate tender will be floated)

9 REFERENCE SPECIFICATIONS

All reference specifications are available on respective official websites of RCF, Kapurthala and RDSO, Lucknow.

Annexure-I

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

TO
Chief Electrical Design Engineer
Rail coach Factory
Kapurthala

Sub: -Submission of Expression of Interest (EOI) for carrying out Safety Audit of Electrical Systems in LHB coaches

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 alongwith 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 Safety Audit of Electrical Systems in LHB Coaches

I / We Understand that

1. This EOI for finalization of the technical specification for carrying out the Safety Audit of Electrical Systems in LHB Coaches
2. RCF 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. RCF 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 RCF 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.	The Consultant can be a single entity or Consortium or JV. 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.	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.
2.	Bidders must have experience in the in the field of Railway Rolling stock (Passenger Coaches) design/ Safety Audit of Electrical Systems of Railway Rolling stock (Passenger Coaches) and should have completed one" <i>Rolling stock design or safety audit of electrical systems of railway rolling stock for passenger coaches "</i> in last 5years.	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.
3.	Firm shall have financial capacity to complete the project. Firm shall submit the details of turnover of the last three Financial Years.	Please submit details of Last three years
4.	ISO Certifications	ISO 9001; ISO/IEC 17020 (latest) or national/international certifications for fire safety of Electrical Equipments in Railway Passenger Cars.