GOVERNMENT OF INDIA: MINISTRY OF RAILWAYS
RESEARCH DESIGNS & STANDARDS ORGANISATION
MINISTRY OF RAILWAYS
MANAK NAGAR, LUCKNOW – 226 011.

EXPRESSION OF INTEREST (EOI) NO. CARR-SS-04/2025
FOR
DEVELOPMENT OF SPECIFICATION FOR ELECTRO-PNEUMATIC PRESSURISED FLUSHING SYSTEM (WITHOUT MOVING PARTS) FOR LHB TYPE COACHES

Ministry of Railways, Research Designs and Standards Organisation (RDSO), Lucknow, India is interested in developing firms/specification for "**Electro-pneumatic pressurised flushing system (without moving parts) for LHB type coaches"** along with functional requirement as Annexure-C uploaded on RDSO website. Firms interested in developing of said items are requested to see the details on RDSO website *www.rdso.indianrailways.gov.in* at **HOME PAGE** under **Expression of Interest (EOI)** appearing in RED colour.

Contact Address:

Director (SS),
Carriage Directorate, Annexe-I,
Research Designs & Standards Organization (RDSO),
Ministry of Railways, Manak Nagar, Lucknow – 226011,
Uttar Pradesh, India
Mob. No. 09794863109

Email address: edcar.rdso@gmail.com, dirssrdso@gmail.com

Enclosure:

1. Proforma for response of EOI and Annexure-A
2. Model criteria of short listing Annexure –B
3. Annexure–C: Functional Requirements for framing of specification for **Electro-pneumatic pressurised flushing system (without moving parts) for LHB type coaches.**

FORMAT FOR LETTER OF RESPONSE
(MODIFY FOR USE WITH SPECIFIC EOI)

Respondents Ref No.:
Date:

Designation of officer to whom the respondent replies
Room No: ,
Building:
Research Designs & Standards Organization
Ministry of Railways
Manak Nagar
Lucknow,
INDIA 226011

Dear Sir,

Subject: RESPONSE TO – EOI FOR PARTICIPATION _____

1. We, the undersigned, offer the following information in response to the Expression of Interest sought by you vide your Notification No._____, dated _____.
2. We are duly authorized to represent and act on behalf of _____ (hereinafter the "respondent")
3. We have examined and have no reservations to the EOI Document including Addenda No(s) _____.
4. We are attaching with this letter, the copies of original documents defining: -
   a) the Respondent's legal status;
   b) its principal place of business;
   c) its place of incorporation (if respondents are corporations); or its place of registration (if respondents are cooperative institutions, partnerships or individually owned firms);
   d) Self certified financial statements of Last three years, clearly indicating the financial turn over and net worth.
   e) Copies of any market research, business studies, feasibility reports and the like sponsored by the respondent, relevant to the project under consideration
5. We shall assist MoR and/or its authorized representatives to obtain further clarification from us, if needed.
   a) RDSO and/or its authorized representatives may contact the following nodal persons for further information on any aspects of the Response:

S. No.	Contact Name	Address	Telephone	E Mail
1				
2				

6. This application is made in the full understanding that:
   a) Information furnished in response to EOI shall be used confidentially by RDSO for the purpose of development of the project.
   b) RDSO reserves the right to reject or accept any or all applications, cancel the EOI and subsequent bidding process without any obligation to inform the respondent about the grounds of same
   c) We confirm that we are interested in participating in development of the project

7. We certify that our turnover and net worth in the last three years is as under:

Financial Year	Turn over	Net worth

8. In response to the EOI we hereby submit the following additional details annexed to this application.

8.1. Details of various items being manufactured/consultancy undertaken.

8.2. Details of customer(s) and supplies made in the field of item under EoI.

8.3. Experience and expertise for the items proposed in EOI.

8.4. Details of man-power with their qualification and experience.

8.5. Detailed proposal for items proposed in EOI including alternative proposal, if any.

8.6. Details of Intellectual Property Rights (IPR) held, patent filed/held and MoU/agreement signed.

8.7. Details of ISO certification

8.8 undertaking as per Annexure-A:

9. The undersigned declare that the statements made and the information provided in the duly completed application are complete, true, and correct in every detail. We also understand that in the event of any information furnished by us being found later on to be incorrect or any material information having been suppressed, RDSO may delete our name from the list of qualified Respondents. We further understand that RDSO will give first preference to the applicants considered relevant for the purpose10. Our response is valid till (date in figures and words):_____

Yours sincerely,

(Sign)
NAME
In the Capacity of
Duly authorized to sign the response for and on behalf of
Date

Annexure-A

(To be taken on non-judicial stamp paper of appropriate value as applicable in the respective state and dully notarised & witnessed)

UNDERTAKING

I, son of …… aged about …..... Years resident of …….. do hereby solemnly affirm as under –

1. That the deponent is the Authorised signatory of *(Name of the Sole Proprietorship Concern/ Partnership Firm/ Registered Company/ Joint Venture).*

2. That the deponent declares on behalf of *(Name of the Sole Proprietorship Concern/ Partnership Firm/ Registered Company/Joint Venture)* that:

   a) In regard to matters relating to the security and integrity of the country, no charge sheet has been filed by an agency of the Government / conviction by a Court of Law for an offence committed by the ----------(name of the entity)or by any sister concern of the ----------(name of the entity) would result in disqualification.

   b) In regard to matters other than the security and integrity of the country, ----------(name of the entity) has not been convicted by a Court of Law or indicted / passed any adverse order by a regulatory authority against it or it's any sister concern which relates to a grave offence, or would constitute disqualification. Grave offence is defined to be of such a nature that it outrages the moral sense of the community.

DEPONENT

VERIFICATION

I declare that the contents of para 1 to 2 above are true as per my knowledge and nothing has been hidden.

DEPONENT

Annexure –B

THE MODEL CRITERIA FOR SHORT LISTING OF FIRMS

EOI can be for the purpose of short-listing some of the firms for further development / finalisation of the specification or it can be only to explore the technology. If EOI is for short listing, the selection criteria should be defined in the EOI.

The model criteria for short listing of firms are indicated as below:

S.No.	**Item**	**Marks**	**Remarks**
1	Turnover of the firm during last 3 years	**20**	Firm having maximum be given full marks and other as percentile.
2	Details of supplies made in the field of item under EoI	**30**	This is the turnover of supplies made in the field of item under EoI. The firm having maximum be given full marks & other as percentile.
3	Experience & expertise for item proposed under EoI	**20**	It is based on years of experience in such products 7 firm having maximum be given full marks & other as percentile.
4	Manpower & their qualification	**10**	No. of persons with profession qualification on firms direct role and percentile
5	Details of patent held & MoU/agreement with OEM	**20**	Number of such items & percentile there of.

Annexure -C

FUNCTIONAL AND INTERFACE REQUIREMENTS FOR ELECTRO PNEUMATIC PRESSURISED FLUSHING SYSTEM (WITHOUT MOVING PARTS) FOR LHB TYPE COACHES.

1. PREAMBLE :

This functional requirement specification has been prepared for development of electro-pneumatic pressurized flushing system (without moving parts i.e. piston cylinder / diaphragm type) on LHB coaches of Indian Railways.

Principal of operation of the system shall be based on displacement of water. The system shall not use piston cylinder / diaphragm type water pressuriser, the compressed air shall be directly used for pressurisation of the water column stored in a cylinder. However, the air should not mix with water & come out to the pan/commode as air-water mixture.

List of normative standards for reference

Sl. No.	Standard	Description
1	EN50155	Railway applications — Rolling stock — Electronic equipment.
2	IEC 60571	Railway applications – Electronic equipment used on rolling stock.
3	ELRS/SPEC/ELC/0019	Technical specification for electron beam irradiated/chemically cured cross linked thin walled flexible elastomeric cables with copper conductors.

2. COACH OPERATING CONDITIONS

Air purifier / disinfection system should function with full efficiency under following coach operating conditions.

2.1. Car-body dynamics:

Equipment shall withstand satisfactorily the vibrations and shocks normally encountered in service as indicated below:

i) Maximum vertical acceleration 1.0g
ii) Maximum longitudinal acceleration 3.0g
iii) Maximum transverse acceleration 2.0g

The vibrations are of sine wave form and the frequency vibration is between 1 Hz to 50 Hz. The amplitude ‘a’ expressed in millimeters is given as a function of f, by equations

$a = 25/f$ for values of f from 1 Hz to 10 Hz.
$a = 250/f^2$ for values of f exceeding 10Hz and up to 50 Hz.

In the direction corresponding to the longitudinal movement of the vehicle, the equipment is subjected for 2 min. to 50 Hz. Vibrations of such a value that the maximum acceleration is equal to 3g.

Annexure -C

FUNCTIONAL AND INTERFACE REQUIREMENTS FOR ELECTRO PNEUMATIC PRESSURISED FLUSHING SYSTEM (WITHOUT MOVING PARTS) FOR LHB TYPE COACHES.

2.2. **Coach-body displacement encountered under dynamic conditions.**

i)	Vertically-	±100 mm
ii)	laterally -	±80 mm
iii)	longitudinally-	±10 mm
iv)	bogie rotation about center pivot-	$\pm 4^0$
v)	Maximum Speed of train -	160 KMPH

2.3. **Ambient Condition:**

(i)	Altitude	:	Sea level to 2500m
(ii)	Operating temperature	:	1^0C to 55^0C
(iii)	Max. Temperature under Sun	:	70° C
(iv)	Relative humidity	:	40% to 95%

(v) The rainfall is fairly heavy.

(vi) During dry weather, the atmosphere is likely to be dusty.

(vii) Temperature variations can be quite high in the same journey or short period of time.

(viii) Coaches operate in coastal areas with continued exposure to salt laden air.

(ix) Coaches may be subjected to frequent external washing with detergents and cleaning of toilets by cleaning agents.

(x) LHB type coach length over coupler is approximately 24 meters.

3. SYSTEM INTERFACE AVAILABLE

3.1. **WATER SUPPLY**

Some LHB coaches have one roof water tank of 30 litre capacity (or as provided) is available over each toilet at a height of about 2030 mm from toilet floor. Water is pumped to this tank from under-frame mounted main water tanks. These roof water tanks are unpressurized and water flows under gravity.

Some LHB coaches have one overhead water tank of capacity of 395 liters or 455 liters or as provided is available at about 2030 mm height. The water flows from this tank to the flushing line under gravity.

3.2. **POWER SUPPLY:**

110V AC/DC supply is available in LHB AC and Non-AC coach circuits. This supply varies from 80V to 140V with 30% ripple in AC & Non-AC LHB type coaches. The equipment shall be designed to withstand ± 30% voltage fluctuations

3.3. **PNEUMATIC SUPPLY**: A limited quantity of air supply of 15 liters/minute/coach maximum can be made available at 6 kg/cm2 through a separate reservoir of 75 liter connected to feed pipe of the train.

Annexure -C

FUNCTIONAL AND INTERFACE REQUIREMENTS FOR ELECTRO PNEUMATIC PRESSURISED FLUSHING SYSTEM (WITHOUT MOVING PARTS) FOR LHB TYPE COACHES.

4. FUNCTIONAL REQUIREMENTS

4.1. The flushing system shall be designed for convenient and efficient flushing i.e. complete removal of fecal matter from the lavatory pan/commode with a minimum usage of pressurized water.

4.2. Actuation of flush cycle shall be done by pressing electrical push button & system shall pressurise water electro-pneumatically based on displacement of water (without moving parts i.e. piston cylinder / diaphragm type), compressed air shall be directly used for pressurisation of the water column stored in a cylinder.

4.3. System shall be designed for built-in colour indication in push button of red and green (GREEN: ready to flush; RED: not ready to flush).

4.4. As an alternate mode of operation system shall also have manual flushing button to be operated in case of failure of air /power supply for making toilet usable.

4.5. The pressurised water shall flush the commode/pan and transfer / push the fecal matter from commode/pan to the Bio-digester tank.

4.6. The system shall work with a pneumatic supply at a pressure of 2.5- 3.5kg /cm². The discharge of water in a single flush shall be about 1.4 to 1.5 liters only.

4.7. The system shall be designed so that only water shall come out of the commode/pan orifices. The compressed air should not escape separately into the Lavatory Pan irrespective of whether the main tank / water cylinder is full of water or partially filled or empty.

4.8. All electrical, electronics and pneumatic parts of system should be shock and vibration proof and should comply with IEC 61373, category-2. The electrical & electronic components / system should also comply with EN50155 for electronic equipment on rolling stock.

5. DESIGN REQUIREMENT

5.1. The system offered must be modular in design, interchangeable, and reliable. All the equipment / components (pneumatic and electronics) shall be housed in a IP65 Stainless enclosure unit to make it into a single interchangeable modular unit so that it can be accommodated in the space available behind the attachment wall (thickness shall be less than 115 mm) with suitable brackets on existing studs.

5.2. The design of the flushing system and fittings used shall have anti-theft and anti-corrosive measures for protection.

5.3. Pneumatic interconnections and wiring shall be routed through protective conduits to prevent accidental damages in transit /service of the coaches.

5.4. All wiring and cabling shall be fire retardant and as per RDSO specification ELRS/SPEC/ELC/0019 latest revision.