Scope of Work

1. SCOPE OF SUPPLY :

1.1 The scope of this tender includes design, supply, installation and commissioning of Liquid Nitrogen storage vessel and its interconnection with existing vaporizer and decanting pump including all civil foundation work. The equipment/system installed must be of proven design, incorporating latest features and state of the art manufacturing technology.

2. PURPOSE :

2.1 Rail Coach Factory (Kapurthala), Punjab is a production unit engaged in production of Indian Railway Passenger Coaches. RCF is manufacturing light weight, stainless steel coaches under the new technology of manufacturing stainless steel coaches. It is required to have additional liquid Nitrogen vessel in order to reduce machine idle time during decanting process, ensure buffer storage in case of supply chain disruption and to have standby vessel during mandatory PESO testing.

3. EXISTING INFRASTRUCTURE :

3.1 RCF has liquid Nitrogen storage vessel of capacity 20 KL. Nitrogen gas is drawn from storage plant is fed into pipe line distribution network via vaporizers and regulator. Pure Nitrogen gas is used for operation of laser machines in the SMS and Bogie Shop.

4. TURN KEY PROJECT :

Design, supply, installation and commissioning of Liquid Nitrogen storage vessel and its interconnection with existing vaporizer and decanting pump including all civil foundation work on Turnkey basis as under:-

4.1 Installation of one Liquid Nitrogen cryogenic vessel of capacity of 13 KL.

4.2 Interconnection of vessel with existing vaporizer system and decanting pumps with stainless stell pipes, valves and other necessary fittings.

4.3 Structural and foundation drawing shall be in the scope of bidder. Preparation of installation drawings and getting the approval from department of Explosives shall be done by successful bidder.

4.4 Necessary approvals from concerned Govt. Authorities/ Statutory Bodies for the installation of the subject system shall be processed and taken by the bidder on behalf of RCF. Bidder shall take the license for installation of the system from Chief Controller of Explosive (CCOE)/PESO, Nagpur. License will be obtained by bidder on behalf of RCF.

4.5 All related Civil Engg. works in connection with installation of subject vessel to be carried out by the bidder including barricading work of the area in accordance to PESO guidelines.

4.6 Detailed engineering of the system including obtaining approval from third party and statutory authorities (for fabrication & installation) for drawing of pressure vessel for fabrication purposes shall be arranged by the bidder.

4.7 Road approach for evacuating liquid Nitrogen from road vesseler to vessel shall be done by successful bidder.

4.8 Supply and installation of Earth Pit with G.I. strip for the Nitrogen storage vessel shall be done by successful bidder.

4.9 Documents pertinent to the system such as design, drawings, operations, manual/calibration certificate etc. shall be provided to RCF, Kapurthala, by successful bidder.

4.10 Maintenance and periodical inspection of the equipment throughout warranty period will be in the scope of successful bidder.

5. DESIGN CHARCTERISTICS :

5.1 One vertically mounted double walled liquid Nitrogen cryogenic storage vessel of capacity 13 KL, shall be installed. The offered layout should be designed keeping in view the space requirement for movement/decanting of Road vesseler to and from the Nitrogen vessel.

5.2 Inner vessel of the vessel should be fabricated from high grade steel adapting the latest manufacturing technologies. Safety standards mentioned /international standards followed shall be detailed in the offer.

5.3 The vessel shall be super insulated with low evaporation rate.

5.4 Pressure vessel should be of state of art design and with highest reliability and shall have practically zero down time.

5.5 To resist adverse impact of environment (air, water and pollution) on all the valves, the material of the valve should be of forged stainless steel only.

5.6 Technical parameters of liquid Nitrogen vessel shall be as per below table:

TECHNICAL PARAMETERS - LIQUID NITROGEN STORAGE VESSEL

Construction	Double Walled (Cryogenic Vessel)
Insulation	Vacuum + Perlite Insulation
Design Code	PED / CE/ EN-13458-2
Statutory authority	PESO
Max. Working Pressure	Upto 37 Bars
Working Temperature	Upto - 196 deg. Celsius
Inner Vessel	Stainless steel
Outer Vessel	Blast cleaned Carbon steel with high-quality anti-Corrosion surface protection and a white polysiloxane finishing coat.
Pipe work	Stainless steel ASTMA312 TP304
Valves	Forged Stainless steel
Gauges	Suitable Pressure gauge and level indicator to be provided
Gross Capacity (liters)	13 KL
Net Capacity (liters)	More than 90% of gross capacity
Foundation Design	The Vessel shall be designed to comply with norms of CCOE, Nagpur. Load cell arrangement with digital display to be provided for monitoring weight of vessel content.
Make of vessel	Ferrox, VRV, Chart Linde, Air Liquide only
Connectivity	The vessel to be interconnected by suitable stainless steel valves & piping with existing vaporizer and centrifugal decanting pump

6. ATMOSPHERIC, CLIMATIC CONDITIONS

6.1 The ambient temperature in the region varies from 0°C to 50°C depending upon the seasonal changes over the year. The relative humidity may be as high as 100% during some parts of the year. The atmospheric conditions for major part of year are expected to be dusty.

6.2 The vessel/equipments offered shall be capable to work under these atmospheric conditions without any adverse effect on their performance.

7. TECHNICAL LITERATURE :

7.1 The successful bidder shall supply 01 copy of technical literature of vessel. The circuit diagram and pipe line layout diagram shall also be supplied by successful bidder. Any other literature, if required for proper function of the system shall also be supplied by firm to RCF.

7.2 Documents pertinent to the system such as operations manual/calibration certificate etc. shall be provided to RCF, Kapurthala, by successful bidder.

7.3 All documents necessary for obtaining approval of statutory authorities Chief Controller of

Explosions Nagpur All designing documents as well as certificates will be supplied by the successful bidder.

8. SAFE WORKING OF CONTRACTUAL STAFF:

8.1 Contractor to abide by all conditions under factory act while working inside RCF plant, he will agree to make available all safety equipment and ensure its enforcement of all safety precaution, he will depute only competent staff with valid competency certification for under taking work of installation and commissioning and will ensure enforcement of minimum wages act. and other legal requirements.

9. WARRANTY:

9.1 Firm will agree to provide warranty for **two (02) years** for working of plant against manufacturing and workmanship related defects including warranty for bought out items.

10. INSPECTION AND TESTING:

10.1 The inspection of Nitrogen vessel will be done by RITES at firm's premises before dispatch.

10.2 After insallation, successful bidder shall arrange inspection of the plant by PESO official and obtain license on behalf of RCF Kapurthala.

10.3 During inspection/test of the system, if the performance falls short of the required prescribed standards, the contractor shall bear all expenses for improving the performance of the system by necessary modification/rectification/replacement of equipment/materials/civil work and carry out another acceptance test.

10.4 RITES inspection fees and PESO license processing fees shall be borne by the contractor.

11. RESPONSIBILITIES OF RCF:

11.1 Adequate space shall be provided to the successful bidder for complete installation of Liquid Nitrogen Storage vessel.

11.2 Water, electricity & compressed air required for installation & commissioning and operation of the Liquid Nitrogen vessel shall be provided free of cost to the successful bidder. Source Power will be of good quality, uninterrupted and free of surge and Compressed Air will be free of moisture.

11.3 Road mobile cranes, FLTs, if required, by the supplier/contractor for installation can be provided on rental/hire basis, if available with RCF.

11.4 All necessary information required for processing the approvals from the concerned regulatory bodies like PESO etc. shall be provided by RCF to the successful bidder.

12. RESPONSIBILITIES OF THE CONTRACTOR:

12.1 The contractor shall execute the work with great promptness, care and accuracy and shall complete the work within 05 months after issue of LOA including the approval of GA drawing.

12.2 The contractor shall place and keep on the works at all times qualified, efficient and competent staff to give necessary directions to his workmen and to see that they execute their work in sound and proper manner. However, the contract staff must keep updated the plant organization informed of the progress time to time.

12.3 The contractor will submit a correct record to consignee showing the names of all the staff and workmen employed by him at railway premises.

12.4 The contractor or his staff and employee will observe rules & regulations of Rail Coach Factory, Kapurthala in regard to entry in the factory, safety and identification. Contractor will also to meet all legal requirements while working in RCF premises.

12.5 All fees including PESO license fees and RITES inspection fees shall be borne by the contractor.

12.6 Contractor while carrying out side work at site will ensure that there is no disruption/stoppage of f existing system in RCF. If any work requires such disruption it will be done in off duty hours or Sunday / holiday with prior intimation to RCF.