

**Request for Quotation
(RFQ)**
Supply of Tracking and Monitoring Devices for Electro and Diesel Locomotives

Project Title: **Serbia Railway Sector Modernization Project (SRSM)**

Source of Funding: **IBRD 9221 YF and CRS 1015 02 D**

Contract Ref: **SER-SRSM-RFQ-G-24-62**

Contract Name: **Supply of Tracking and Monitoring Devices for Electro and Diesel Locomotives**

Date: **February 21, 2024**

Dear Sirs,

1. You are invited to submit your price quotation for:

Supply of Tracking and Monitoring Devices for Electro and Diesel Locomotives.

Line Item N°	Description of Goods	Quantity	Physical unit
1.	Monitoring equipment (communication and control module, fuel consumption detector, with a fuel tank cap sensor and aerosol fire extinguishing equipment in electrical cabinets) for diesel locomotives	17	pcs
2.	Monitoring equipment (communication and control module, aerosol fire extinguishing equipment in electrical cabinets) for electric locomotives	33	pcs
3.	Monitoring software with hosting, maintenance, data storage and licenses with 2 (two) year's subscription	1	pcs
4.	Desktop computers	30	pcs
5.	Installation and deployment of monitoring equipment (communication and control module, fuel consumption detector, with a fuel tank cap sensor and aerosol fire extinguishing equipment in electrical cabinets) on diesel locomotives	17	pcs
6.	Installation and deployment of Monitoring equipment (communication and control module and aerosol fire extinguishing equipment in electrical cabinets) on electric locomotives	33	pcs
7.	Putting in operation, Testing and Commissioning of the overall monitoring system	/	/
8.	Preparation of technical documentation and a security plan according to the type of locomotive, plan and design of the technical protection system.	/	/
9.	Provide trainings and workshops for the all-level users	/	/

2. You must quote for all the items under this Invitation. Price quotations will be evaluated for all the items together and a contract awarded to the firm offering the lowest evaluated total cost of all the items.
3. Your price quotation in the form attached may be submitted electronically at the email address zorica.petrovic@mfin.gov.rs, Cc: larisa.puzovic@purs.gov.rs; ljljana.dzuver@mfin.gov.rs and shall consist of:
 - Request for Quotation (in PDF format)
 - Terms and Conditions of Supply - **filled in and signed** (in PDF format)
 - Technical Specification - **filled in and signed** (in PDF and word format)
 - Form of Quotation - **filled in and signed** (in PDF format)
4. The deadline for receipt of your quotation (s) by the Purchaser at the address indicated in Paragraph 6 is: **March 15, 2024, until 12.00 hours, noon, local time.**
5. **Your quotation should be accompanied by the following technical documentation, evidence and catalogue(s) and other printed material or pertinent information for each item quoted:**

Communication and Control Module Documentation	<p>Supplier shall submit the following documentation for Communication and Control Module:</p> <ul style="list-style-type: none"> • Catalog or brochure from the manufacturer containing all technical specifications and an image of the offered equipment, with the name and label, for the communication module of the locomotive monitoring equipment, as per the requested technical specification. • Certificate or Extract of compliance with the Regulation on radio equipment and telecommunications terminal equipment in accordance with the norms of the Republic of Serbia, issued by the Regulatory Agency for Electronic Communications and Postal Services in the name of the Supplier, valid on the date of the call for bids and on the date of contract award. • Photocopy of Declaration of Conformity (CE).
Fuel Consumption Detectors Documentation	<p>Supplier shall submit the following documentation for Fuel Consumption Detectors:</p> <ul style="list-style-type: none"> • Technical documentation for fuel consumption detectors as per the requested technical specification. • Photocopy of Declaration of Conformity (CE).
Aerosol Fire Extinguishing Equipment Documentation and Evidence	<p>Supplier shall submit the following documentation for Aerosol Fire Extinguishing Equipment:</p> <ul style="list-style-type: none"> • Technical documentation for aerosol fire extinguishing equipment as per the requested technical specification. • Photocopy of the certificate of compliance with the EMC Electromagnetic Compatibility Regulation requirements (Official Gazette of RS no. 25/2016), issued by an Accredited Laboratory. • Photocopy of the certificate or License that the product is marked with the Green Label – GREEN LABEL.

	<ul style="list-style-type: none"> • Photocopy of the toxicological report that the extinguishing agent is non-toxic. • Photocopy of the certificate from an accredited EU institution like 'KIWA' or similar for extinguishing class A, B fires. • Photocopy of the confirmation that it is on the SNAP list of eco-friendly products. • Photocopy of the certificate that the products are manufactured in accordance with ISO 9001: 2015 and ISO 14001:2015 standards. • Photocopy of the certificate that it has a lifespan of at least 15 years. • Photocopy of the TUV certificate for generators proving their safety level and operational reliability (SIL level 2 and 3). • Photocopy of technical sheets, catalogs, or similar proving that the offered equipment fully meets the requirements in the tender documentation. • Photocopy of the confirmation that includes a 3-year fault warranty and a 5-year functionality warranty. • Photocopy of the compliance statement that products have the CE mark. • Photocopy of the declaration of compliance with the AS 4487-2013 standard requirements. • Photocopy of the certificate of conformity with the SRPS EN 15276 standard – fire extinguishing systems with condensed aerosol or equivalent. • Photocopy of the certificate of conformity for extinguishing class A, B, and E fires.
<p>Application for tracking vehicles and monitoring fuel consumption</p>	<p>Supplier shall submit the following documentation for application:</p> <ul style="list-style-type: none"> • Technical documentation for the software platform as per the characteristics requested in the technical specification. • Suppliers are required to submit a Declaration with proof of the existence of the application, including a link to the application and a specified demo access for checking the functionalities requested: real-time monitoring of equipment and fuel consumption detectors and the addition of automatic aerosol fire extinguishing in electrical cabinets. The demo access details should be stated in the Declaration.

A Supplier who does not manufacture an item/s, the Supplier shall provide evidence of being duly authorized by a manufacturer (Manufacturer’s Authorization Form) issued by Head Quarters/Branch Offices or submit documentation on, its status as a supplier, to the satisfaction of the Purchaser (e.g. authorized dealer/ distributor of the items).

The quotation shall also include names and addresses of firms providing service facilities in Serbia.

6. Your quotation(s) should be submitted as per the following instructions and in accordance with the attached Contract. The attached Terms and Conditions of Supply are an integral part of the Contract.
- (i) PRICES: The prices should be quoted in RSD (Serbian Dinar), for the Total Cost at final destinations listed in Annex 1- Point 4. Project Site Specifications, which includes all taxes, customs, duties, inland transportation, and insurance, loading and unloading.
 - (ii) EVALUATION OF QUOTATIONS: Offers determined to be substantially responsive to the technical specifications will be evaluated by comparison of the total price at the final destinations as per paragraph 2 above.

In evaluating the quotations, the Purchaser will determine for each bid the evaluated price by adjusting the price quotation by making any correction for any arithmetical errors as follows:

- a. where there is a discrepancy between amounts in figures and in words, the amount in words will govern;
- b. where there is a discrepancy between the unit rate and the line-item total resulting from multiplying the unit rate by the quantity, the unit rate as quoted will govern;
- c. if a Supplier refuses to accept the correction, his quotation will be rejected.

The Purchaser shall determine, to its satisfaction, whether the Supplier that is selected as having submitted the lowest quotation and substantially responsive to the technical specifications, meets the following qualifying criteria:

- a. Specific Experience: The Supplier shall demonstrate that it has successfully completed at least 2 (two) contracts within the last 5 (five) years prior to quotation submission deadline, each with a value of at least EUR 35,000 that have been successfully and substantially completed and that are similar in nature and complexity to the Goods and Related Services under the Contract. For a joint venture, this requirement may be met by all members combined.

The determination shall be based upon an examination of the documentary evidence of the Suppliers qualifications submitted by the Supplier. The determination shall not take into consideration the qualifications of other firms such as the Supplier's subsidiaries, parent entities, affiliates, subcontractors, or any other firm(s) different from the Supplier.

(iii) AWARD OF CONTRACT: The award will be made to the Supplier offering the lowest substantially evaluated responsive quotation and that meets the required technical and financial capabilities. The successful Supplier will sign a Contract as per attached form of contract and terms and conditions of supply.

(iv) VALIDITY OF THE OFFER: Your quotation(s) should be valid for a period of ninety (90) days from the deadline for receipt of quotation(s) indicated in Paragraph 4 of this Request for Quotation.

7. Further information can be obtained from address below:

Zorica Petrović
CFU Procurement Specialist
Ministry of Finance
Central Fiduciary Unit
Sremska 3-5
11000 Belgrade
Republic of Serbia
Tel/Fax: +381 11 202-15-30
E-mail: zorica.petrovic@mfin.gov.rs

8. Inspections and Audits

- 8.1 The Supplier shall carry out all instructions of the Purchaser which comply with the applicable laws where the destination is located.
- 8.2 The Supplier shall permit, and shall cause its Subcontractors and consultants to permit, the World Bank (Bank) and/or persons appointed by the Bank to inspect the Supplier's offices and all accounts and records relating to the performance of the Contract and the submission of the bid, and to have such accounts and records audited by auditors appointed by the Bank if requested by the Bank. The Supplier's and its Subcontractors and consultants' attention is drawn to Clause 5 Fraud and Corruption of the Form of Contract, which provides, inter alia, that acts intended to materially impede the exercise of the Bank's inspection and audit rights constitute a prohibited practice subject to contract termination (as well as to a determination of ineligibility pursuant to the Bank's prevailing sanctions procedures).

9. Please Confirm by E-mail the receipt of this invitation and whether or not you will submit the price quotation(s).

Sincerely,

Zorica Petrović

CFU Procurement Specialist

FORM OF CONTRACT

THIS AGREEMENT number **SER-SRSM-RFQ-G-24-62** made on _____ 2024, between the Ministry of Construction, Transport and Infrastructure (MCTI), having its principal place of business at Nemanjina 22-26, 11000 Belgrade, Republic of Serbia (hereinafter called “the Purchaser”) on the one part and _____ having its principal place of business at _____ (hereinafter called “the Supplier”) on the other part.

WHEREAS the Purchaser has invited quotation for **Supply of Tracking and Monitoring Devices for Electro and Diesel Locomotives** to be supplied by Supplier, viz. Contract Ref No **SER-SRSM-RFQ-G-24-62** (hereinafter called “Contract”) and has accepted the Bid by the Supplier for the supply of goods under Contract at the sum of _____ (_____) exclusive of VAT hereinafter called “the Contract Price”.

The Contract will be effective from the date of signing and will last until the finalization of the delivery upon Purchaser request, as specified in Terms and Conditions of supply.

NOW THIS AGREEMENT witnesses as follows:

1. The following documents shall be deemed to form and be read and construed as part of this agreement:
 - a) **Form of Quotation; Term and Conditions of Supply, Technical Specification;**
 - b) **Addendum (if applicable);**
2. Taking into account payments to be made by the Purchaser to the Supplier as hereinafter mentioned, the Supplier hereby concludes an Agreement with the Purchaser to execute and complete the supply of Contract and remedy any defects therein in conformity with the provisions of Contract.

The goods that are to be procured under this contract are for the needs of **JSC Serbia Cargo (hereinafter: End Recipient)** and respective payments will be made by the Purchaser (the MoCTI) from the Serbia Railway Sector Modernization Project (SRSM) funds.

3. Testing

- 3.1 The Supplier shall at its own expense and at no cost to the Purchaser carry out all such tests and/or inspections of the Goods and Related Services as are specified in Annex 1 – Point 5. Inspection and testing.
- 3.2 Whenever the Supplier is ready to carry out any such test and inspection, it shall give a reasonable advance notice, including the place and time, to the Purchaser. The Supplier shall obtain from any relevant third party or manufacturer any necessary permission or

consent to enable the Purchaser and End Recipient or its designated representative to attend the test and/or inspection.

3.3 The Purchaser and End Recipient may require the Supplier to carry out any test and/or inspection not required by the Contract but deemed necessary to verify that the characteristics and performance of the Goods comply with the technical specifications, codes and standards under the Contract, provided that the Supplier's reasonable costs and expenses incurred in the carrying out of such test and/or inspection shall be added to the Contract Price. Further, if such test and/or inspection impedes the progress of manufacturing and/or the Supplier's performance of its other obligations under the Contract, due allowance will be made in respect of the Delivery Dates and Completion Dates and the other obligations so affected.

4. The Purchaser hereby covenants to pay in consideration of the goods supply and acceptance of Contract and remedying of defects therein, the Contract Price in accordance with Payment Conditions prescribed by Contract.

5. Termination

4.1 Termination for Default

- (a) The Purchaser, without prejudice to any other remedy for breach of Contract, by written notice of default sent to the Supplier, may terminate the Contract in whole or in part:
 - (i) if the Supplier fails to deliver any or all of the Goods and Services within the period specified in the Contract, or within any extension thereof granted.
 - (ii) if the Supplier fails to perform any other obligation under the Contract; or
 - (iii) if the Supplier, in the judgment of the Purchaser has engaged in fraud and corruption, as defined in Clause 5 below, in competing for or in executing the Contract.
- (b) In the event the Purchaser terminates the Contract in whole or in part, the Purchaser may procure, upon such terms and in such manner as it deems appropriate, Goods or Related Services similar to those undelivered or not performed and the Supplier shall be liable to the Purchaser for any additional costs for such similar Goods or Related Services. However, the Supplier shall continue performance of the Contract to the extent not terminated.

4.2 Termination for Insolvency.

- (a) The Purchaser may at any time terminate the Contract by giving notice to the Supplier if the Supplier becomes bankrupt or otherwise insolvent. In such event, termination will be without compensation to the Supplier, provided that such

termination will not prejudice or affect any right of action or remedy that has accrued or will accrue thereafter to the Purchaser.

4.3 Termination for Convenience.

- (a) The Purchaser, by notice sent to the Supplier, may terminate the Contract, in whole or in part, at any time for its convenience. The notice of termination shall specify that termination is for the Purchaser's convenience, the extent to which performance of the Supplier under the Contract is terminated, and the date upon which such termination becomes effective.
- (b) The Goods that are complete and ready for shipment within twenty-eight (28) days after the Supplier's receipt of notice of termination shall be accepted by the Purchaser at the Contract terms and prices. For the remaining Goods, the Purchaser may elect:
 - (i) to have any portion completed and delivered at the Contract terms and prices; and/or
 - (ii) to cancel the remainder and pay to the Supplier an agreed amount for partially completed Goods and Related Services and for materials and parts previously procured by the Supplier

6. Fraud and Corruption

6.1 If the Purchaser determines that the Supplier and/or any of its personnel, or its agents, or its Subcontractors, consultants, service providers, suppliers and/or their employees has engaged in corrupt, fraudulent, collusive, coercive or obstructive practices (as defined in the prevailing Bank's sanctions procedures), in competing for or in executing the Contract, then the Purchaser may, after giving 14 days' notice to the Supplier, terminate the Supplier's employment under the Contract and cancel the contract, and the provisions of Clause 4 shall apply as if such expulsion had been made under Sub-Clause 4.1.

7. Inspections and Audits

7.1 The Supplier shall carry out all instructions of the Purchaser which comply with the applicable laws where the destination is located.

7.2 The Supplier shall permit, and shall cause its Subcontractors and consultants to permit, the Bank and/or persons appointed by the Bank to inspect the Supplier's offices and all accounts and records relating to the performance of the Contract and the submission of the bid, and to have such accounts and records audited by auditors appointed by the Bank if requested by the Bank. The Supplier's and its Subcontractors and consultants' attention is drawn to Clause 5 Fraud and Corruption, which provides, inter alia, that acts intended to materially impede the exercise of the Bank's inspection and audit rights

constitute a prohibited practice subject to contract termination (as well as to a determination of ineligibility pursuant to the Bank's prevailing sanctions procedures).

Signature and seal of the Purchaser:

FOR AND BEHALF OF

Goran Vesić
Minister

Signature and seal of the Supplier:

FOR AND BEHALF OF

Name of Authorized Representative

FORM OF QUOTATION

(Date *insert*)

To:
Ministry of Construction, Transport and Infrastructure
Nemanjina 22-26
11000 Belgrade
Republic of Serbia

We offer to execute the **Supply of Tracking and Monitoring Devices for Electro and Diesel Locomotives**, Ref No: **SER-SRSM-RFQ-G-24-62**, in accordance with the Conditions of Contract accompanying this Quotation for the Contract Price of _____ (amount in words and numbers) (_____) RSD exclusive of VAT. We propose to complete the delivery of goods described in the Contract within a period of _____ calendar days from the Date of Signing of the Contract.

This Quotation and your written acceptance will constitute a binding Contract between us. We understand that you are not bound to accept the lowest or any Quotation you receive.

We hereby confirm that this Quotation complies with the Validity of the Quotation required by the proposal documents.

Authorized Signature: *insert*
Name and Title of Signatory *insert*

Name of Supplier: *insert*
Address: *insert*
Phone Number: *insert*
Fax Number: *insert*

Terms and Conditions of Supply

Project Title: **Serbia Railway Sector Modernization Project (SRSM)**

Purchaser: **Ministry of Construction, Transport and Infrastructure**

Contract Ref No: **SER-SRSM-RFQ-G-24-62**

1. Prices and Schedules for Supply

Item No.	Description of Goods	Qty (pcs)	Net Unit Price (RSD) at final destination (exclusive of VAT)	Total price per line (RSD) at final destination (exclusive of VAT)	Total VAT per line (RSD)	Total Price (RSD) at final destination (includes all taxes, VAT, customs, duties, inland transportation and insurance)	Delivery Schedule from contract signature date (<i>insert days</i>)
1	2	3	4	5 (3x4)	6	7 (5+6)	8
1.	Monitoring equipment (communication and control module, fuel consumption detector, with a fuel tank cap sensor and aerosol fire extinguishing equipment in electrical cabinets) for diesel locomotives	17	<i>insert</i>	<i>insert</i>	<i>insert</i>	<i>insert</i>	<i>Insert</i>
2.	Monitoring equipment (communication and control module, aerosol fire extinguishing equipment in electrical cabinets) for electric locomotives	33	<i>insert</i>	<i>insert</i>	<i>insert</i>	<i>insert</i>	<i>Insert</i>
3.	Monitoring software with hosting, maintenance, data storage and licenses with 2	1	<i>insert</i>	<i>insert</i>	<i>insert</i>	<i>insert</i>	<i>Insert</i>

	(two) year's subscription						
4.	Desktop computers	30	<i>insert</i>	<i>insert</i>	<i>insert</i>	<i>insert</i>	<i>Insert</i>
5.	Installation and deployment of equipment for monitoring (communication and control module, fuel consumption detector, with a fuel tank cap sensor and aerosol fire extinguishing equipment in electrical cabinets) on diesel locomotives	17	<i>insert</i>	<i>insert</i>	<i>insert</i>	<i>insert</i>	<i>Insert</i>
6.	Installation and deployment of equipment for monitoring (communication and control module and aerosol fire extinguishing equipment in electrical cabinets) on electric locomotives	33	<i>insert</i>	<i>insert</i>	<i>insert</i>	<i>insert</i>	<i>Insert</i>
7.	Putting in operation, Testing and Commissioning of the overall monitoring system	/	<i>insert</i>	<i>insert</i>	<i>insert</i>	<i>insert</i>	<i>Insert</i>
8.	Preparation of technical documentation and a security plan according to the type of locomotive, plan and design of the technical		<i>insert</i>	<i>insert</i>	<i>insert</i>	<i>insert</i>	<i>Insert</i>

	protection system.						
9.	Provide trainings and workshops for the all-level users	/	<i>insert</i>	<i>insert</i>	<i>insert</i>	<i>insert</i>	<i>insert</i>
TOTAL AMOUNT (RSD)				<i>insert</i>	<i>insert</i>	<i>insert</i>	

Note: In case of discrepancy between unit price and total derived from unit price, the unit price shall prevail.

2. **Fixed Price:** The prices indicated above are firm and fixed and not subject to any adjustment during contract performance.
3. The Purchaser reserves the right at the time of contract finalization to increase or decrease by up to 10% the quantity of goods and services originally specified without any change in unit prices as well as other terms and conditions.
4. **Delivery Schedule:** The delivery should be completed as per the above schedule but **not exceeding 200 calendar days from contract signature.**
5. **Applicable Law:** The Contract shall be interpreted in accordance with the laws of the Republic of Serbia.
6. **Resolution of Disputes:** The Purchaser and the Supplier shall make every effort to resolve amicably by direct informal negotiation any disagreement or dispute between them under or in connection with the Contract. In the case of a dispute between the Purchaser and the Supplier, the dispute shall be settled in accordance with the country procedures.
7. **Payment** for your invoice will be made as follows:
 - 1) **Payment for Goods:** Payment for Goods supplied from within the Purchaser's Country shall be made in **RSD**, following submission of invoices in duplicate approved by the Purchaser as follows:
 - **On Acceptance: One hundred (100) percent** of the Contract Price of the Goods shall be paid to the Supplier within forty-five (45) days after the date of the **Operational Acceptance Certificate** for the respective delivery issued by the Purchaser.
 - 2) **Payment for Services:** Payment for Services supplied from within the Purchaser's Country shall be made in **RSD**, following submission of invoices in duplicate approved by the Purchaser as follows:
 - **On Delivery: One hundred (100) percent** of the Contract Price of the related Services shall be paid to the Supplier within **forty-five (45)** on receipt of the Services and upon submission of the **Final Completion Report.**
8. **Warranty:** The warranty period for equipment installed in locomotives, including services of installation, setup, and commissioning, shall be a minimum of 24 months

from respective installation dates stated in Taking-Over Certificate. This warranty applies to all parts of the equipment installed on the End Recipient's locomotives. Upon request of the Purchaser and without additional costs, the Supplier is required to rectify any malfunction in the faulty equipment and replace it with functioning ones in cases where:

- The malfunction is a consequence of a defect in the equipment itself.
- The malfunction is a consequence of the Supplier's error during installation or configuration.
- The malfunction is due to a hidden defect.

During the warranty period, the Supplier is obligated, in up to five (5) working days and at their own expense, to restore all hardware and software to functional condition and perform repairs within the warranty period at the Project Locations where installation was carried out, without additional costs to the Purchaser. Following the intervention on the locomotive and equipment, it is the service provider's duty to conduct testing of the device operation and verify all functionalities.

9. Trainings: The Supplier is obligated to provide training for the system users who are employees of the End Recipient. This training should equip them with the skills necessary for the usage, maintenance, settings, and operation of the equipment and software prior to the official qualitative acceptance of the system. It is the responsibility of the Supplier to compile a Training Report documenting the conducted training in handling the equipment/devices and technical protection systems. This report must be in accordance with the regulations governing technical protection jobs and the use of technical means, and at least two copies should be prepared.

Should there be a need for additional training for operators and administrators, it is the duty of the Supplier to provide such training to the extent necessary, as per the End Recipient's request. The End Recipient reserves the right to request additional explanations without any extra charges, to ensure that the system's operational process is not compromised.

10. Packaging and Marking Instructions: The Supplier shall provide standard packing of the Goods as required to prevent their damage or deterioration during transit to their final destination, as indicated in the Contract.
11. Defects: All defects will be corrected by the Supplier without any cost to the Purchaser within 30 days from the date of notice by Purchaser. Name and address of service facility which the defects are to be corrected by the supplier within the warranty period:

Address _____ *INSERT* _____

11. Force-Majeure: The supplier shall not be liable for penalties or termination for default if and to the extent that its delay in performance or other failure to perform its obligations under the Contract is the result of an event of Force-Majeure.

For purposes of this clause, "Force-Majeure" means an events beyond the control of the Supplier and not involving the Supplier's fault or negligence and not foreseeable. Such events may include, but not restricted to, act of Purchaser in its sovereign capacity, wars or revolutions, fires, floods, epidemics, quarantine restrictions, and freight embargoes.

If a Force-Majeure situation arises, the Supplier shall promptly notify the purchaser in writing of such condition and the cause thereof. Unless otherwise directed by the Purchaser in writing, the Supplier shall continue to perform its obligations under the Contract as far as is reasonably practical, and shall seek all reasonable alternative means for performance not prevented by Force-Majeure event.

12. Required Technical Specifications

- (i) General Description
- (ii) Specific details and technical standards
- (iii) Performance Parameters

Supplier confirms compliance with above specifications { **In case of deviations supplier to list all such deviations** }.

NAME OF SUPPLIER _____

Authorized Signature and Stamp _____

Place: _____

Date: _____

Annex 1

List of Goods and Delivery Schedule, List of Related Services and Completion Schedule, Technical Specification, Project Location and Inspection and Testing

(Filled Annex 1 TO BE INCLUDED IN THE QUOTATION)

1. List of Goods and Delivery Schedule

Line Item N°	Description of Goods	Quantity	Physical unit	Final Destination (Project Site) as specified in RFQ	Latest Delivery Date
1.	Monitoring equipment (communication and control module, fuel consumption detector, with a fuel tank cap sensor and aerosol fire extinguishing equipment in electrical cabinets) for diesel locomotives	17	pcs	Supplier premises	45 days from Contract signing
2.	Monitoring equipment (communication and control module, aerosol fire extinguishing equipment in electrical cabinets) for electric locomotives	33	pcs	Supplier premises	45 days from Contract signing

3.	Monitoring software with hosting, maintenance, data storage and licenses with 2 (two) year's subscription	1	pcs	JSC Serbia Cargo Headquarters - Nemanjina Street No. 6, 11000 Belgrade, Republic of Serbia	45 days from Contract signing
4.	Desktop computers	30	pcs	JSC Serbia Cargo Headquarters - Nemanjina Street No. 6, 11000 Belgrade, Republic of Serbia	45 days from Contract signing

2. List of Related Services and Completion Schedule

Service	Description of Service	Quantity	Physical Unit	Place where Services shall be performed	Latest Completion of Services
1.	Installation and deployment of monitoring equipment (communication and control module, fuel consumption detector, with a fuel tank cap sensor and aerosol fire extinguishing equipment in electrical cabinets) on diesel locomotives	Pcs	17	Workshops in Subotica, Pančevo, Ruma, Požarevac, Kraljevo and Niš	120 days from delivery Item no. 1
2.	Installation and deployment of monitoring equipment (communication and control module and aerosol fire extinguishing equipment in electrical cabinets) on electric locomotives	Pcs	33	Workshops in Beograd and Niš	120 days from delivery Item no. 2

3.	Putting in operation, Testing and Commissioning of the overall monitoring system	/	/	JSC Serbia Cargo Headquarters - Nemanjina Street No. 6, 11000 Belgrade, Republic of Serbia	30 days from completion of Services no. 1. And no.2
4.	Preparation of technical documentation and a security plan according to the type of locomotive, plan and design of the technical protection system.			Supplier premises	30 days from completion of no. 1. and no.2
5.	Provide trainings and workshops for the all-level users	/	/	JSC Serbia Cargo Headquarters - Nemanjina Street No. 6, 11000 Belgrade, Republic of Serbia	5 days from completion of Service no. 4.

3. Technical Specifications

This procurement involves the acquisition and delivery of a locomotive monitoring system for 50 hauling vehicles, comprising 17 diesel and 33 electric locomotives operated by Serbia Cargo.

The system must provide continuous (24/7/365) monitoring, including fuel consumption and reservoir cap opening detectors for diesel locomotives, and automatic aerosol fire extinguishing systems for electrical command cabinets in all listed locomotives. The contract includes installation, commissioning, licensing, server provision (including backup and redundancy), technical documentation, security planning, training, technical support, maintenance, and servicing during the warranty period. The system should fully integrate with the required software platform, including all necessary connections, configurations, and customizations.

A list of locomotives with their basic characteristics and potential installation service locations will be provided to the selected Supplier before the contract signing. Given that all locomotives are operational, the Supplier will receive a written notification of the locomotive's availability and location four days prior to its availability for the installation service of the planned monitoring systems.

Installation, configuration, commissioning, technical support, maintenance, and servicing of the equipment, fuel consumption detectors, and fire extinguishing system will be carried out within the territory of the Republic of Serbia at the locations of JSC Serbia Cargo

The Goods and Related Services shall comply with the following Technical Specifications and Standards:

<i>Item No</i>	<i>Name of Goods or Related Service</i>	<i>Technical Specifications and Standards</i>		<i>Offered functionality</i>
1.	Monitoring devices and equipment	Communication Module	<ul style="list-style-type: none"> ▪ Network communication: 850/900/1800/1900 MHz ▪ USB port: 2.0 micro-USB ▪ Micro SIM slot ▪ GPRS commands configuration and debugging ▪ Detection of disconnection from power supply ▪ Power supply voltage: 10 to 30 V DC ▪ Operating temperature: -40 to +85°C without battery ▪ Declaration of Conformity (CE) ▪ Permit for use in the Republic of Serbia 	
		Control Module	<ul style="list-style-type: none"> ▪ Internal power supply: minimum 170 mAh ▪ Bluetooth v4.0 ▪ GNSS receiver ▪ Power supply voltage: 10 to 30 V ▪ Surge protection ▪ Operating temperature: -40 to +85°C without battery 	

<i>Item No</i>	<i>Name of Goods or Related Service</i>	<i>Technical Specifications and Standards</i>		<i>Offered functionality</i>
			<ul style="list-style-type: none"> ▪ Declaration of Conformity (CE) 	
		<p>Fuel Consumption Detector</p>	<ul style="list-style-type: none"> ▪ designed for measuring the level of light hydrocarbons of petroleum (diesel, gasoline, kerosene, etc.) ▪ housing protection IP67 ▪ communication BLE (Bluetooth Low Energy) minimum version 4.0 or newer ▪ built-in battery minimum 2,7 Ah ▪ measurement error no more than 1% ▪ built-in accelerometer ▪ built-in temperature measurement ▪ operating temperature range minimum from -40 to +85°C ▪ operational work minimum 7 years ▪ measurement of vertical angle - with a change of angle of more than 60 degrees switching to power saving at a maximum of 30% consumption (storage in the warehouse) ▪ detection of radio signal blocking ▪ possibility of bending the measuring tube without losing work minimum up to 15% to avoid obstacles during installation ▪ Declaration of Conformity (CE) 	
		<p>Addition for automatic fire extinguishing with aerosols in the electrical cabinet</p>	<ul style="list-style-type: none"> ▪ Addition should include an aerosol generator, control module complete with battery and appropriate thermos cable for a minimum temperature of 68°C. ▪ Extinguishes class A, B, and C fires, can be activated electrically independently. ▪ Weight of the aerosol generator with housing: 310 g ± 5% 	

<i>Item No</i>	<i>Name of Goods or Related Service</i>	<i>Technical Specifications and Standards</i>		<i>Offered functionality</i>
			<ul style="list-style-type: none"> ▪ Weight of extinguishing agent filling: 20 g ▪ Activation by electric impulse: 6/12/24/36 VDC min 0.8 A for 3-4 s ▪ Type of activator: resistance heating element 1,6–3,6 Ohms ▪ Discharge time: 3-6 s ▪ Maximum jet length: 1,14m ▪ Self-activation temperature: 300° C ▪ Dimensions: 165mm x Ø32 mm. ▪ Declaration of Conformity (CE) 	
		<p>General requirements for monitoring devices and equipment</p>	<p>The monitoring equipment and the fuel consumption detector with the addition for automatic fire extinguishing with aerosols, should be of such dimensions that they are suitable for installation in any type of locomotive and must not impair its functionality. The installation of the devices must not interfere with the warranty conditions defined by the Manufacturer of the assets.</p> <p>The Purchaser will provide access to the reservoir for the installation of the fuel consumption detectors in case there are metal plates on diesel locomotives that prevent the installation of the detectors (such as engine covers or stepping platforms). The voltage supply on the locomotives is of the order of 64V to 110V, so it is mandatory to install voltage converters to a level of up to 30V.</p>	
2.	Software requirements	Software functionalities	<ul style="list-style-type: none"> ▪ The software should be based on a web application platform. Access to the software should be enabled through commonly used browsers, ensuring compatibility and ease of use. ▪ Online monitoring of locomotive positions, precise 	

<i>Item No</i>	<i>Name of Goods or Related Service</i>	<i>Technical Specifications and Standards</i>		<i>Offered functionality</i>
			<p>determination of location in space and time and displaying on a map (with the possibility of multiple "zooming") with precise geographical coordinates of the area.</p> <ul style="list-style-type: none"> ▪ Audio and visual alarming and informing the user in case of incidental situations, ▪ Continuous reception of GNSS signals and determination of the position of the locomotive with a positioning accuracy of approximately 2.5 m, ▪ Displaying the position of the locomotive on the map of the Republic of Serbia ▪ Displaying information about the parameters of the locomotive: contact lock, speed, traveled distance, and information from the fuel consumption detector and the addition for automatic fire extinguishing with aerosols ▪ Displaying information about driving parameters: current speed, path, and direction ▪ Displaying information about the fuel level in the propulsion tank, ▪ Drawing markers, regions, and points of special interest, ▪ Independent and autonomous creation of reports, ▪ Reprogramming and entering new parameters in real-time for system elements in locomotives, ▪ In the module for administration of all system elements (installed devices, locomotives, users), depending on the assigned access rights and granted authorizations, it must be possible to create, edit, and delete them, as well as to form and monitor a certain subset (organizational group) of locomotives, creating appropriate Reports, as well 	

Item No	Name of Goods or Related Service	Technical Specifications and Standards		Offered functionality
			<p>as remote change of parameters and software of devices in locomotives.</p> <ul style="list-style-type: none"> ▪ Software should enable chronological analysis of data on the movement of locomotives with the procured equipment for monitoring (graphical representation of the movement path in a certain time period), creation, and work with markers, defining allowed paths and movement zones of locomotives (work with routes and regions), locating the nearest locomotives relative to a defined arbitrary reference point on the map, and similar. ▪ Desktop access to the system with a computer is provided for the entire duration of the license, Android and IOS applications for mobile phones, all without limitation on the number of users. 	
		Communication protocol	<ul style="list-style-type: none"> ▪ The communication protocol of the purchased equipment must be implemented in the installed application on the server responsible for communication with the equipment (acceptance of incoming data and entry into the database, changing parameters, and issuing commands). 	
		General requirements for the software	<ul style="list-style-type: none"> ▪ Data consistency and redundancy must be enabled and regular automated monthly backup of the database, as well as administering system elements, generating log-files, the possibility of access authorization, restrictions, and redirection of operator services and results at a specific time and to remote locations. 	

<i>Item No</i>	<i>Name of Goods or Related Service</i>	<i>Technical Specifications and Standards</i>		<i>Offered functionality</i>
			<ul style="list-style-type: none"> ▪ The software should be cloud-oriented, the Supplier is obliged to provide hosting and maintenance for the entire duration of the contract, as well as technical and user support. ▪ The Supplier should provide storage capacity for storing data of this system, which must be at least 24 (twenty four) months, with optimal data processing speed. 	
		Number and duration of License/s	<ul style="list-style-type: none"> ▪ License/s must have multi-user support users simultaneously, for the period of 2 (two) year's subscription 	
3.	Desktop Computers	System Configuration	<ul style="list-style-type: none"> ▪ Processor: Minimum of 4 cores/8 threads, not older than the 11th generation Intel Core or 3rd generation AMD Ryzen processors, or equivalent ▪ Operating System: Windows 11 Pro ▪ MS Office: Microsoft office 2021 Home and Business, retail lifetime subscription ▪ Graphics processing unit: Integrated graphics - QHD capable ▪ Storage: 500 GB SSD. ▪ Memory: 8 GB RAM. ▪ Monitor: 23 inches, QHD 	

Unless otherwise specified, the requirements in these Technical Specifications are presented as a **minimum standard** which the offered goods must meet to be compliant. The Supplier is expected to submit the following documentary evidence (brochures, technical data sheets, etc.) of the technical compliance of his quotation, namely:

<p>Communication and Control Module Documentation</p>	<p>Supplier shall submit the following documentation for Communication and Control Module:</p> <ul style="list-style-type: none"> • Catalog or brochure from the manufacturer containing all technical specifications and an image of the offered equipment, with the name and label, for the communication module of the locomotive monitoring equipment, as per the requested technical specification. • Certificate or Extract of compliance with the Regulation on radio equipment and telecommunications terminal
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	<p>equipment in accordance with the norms of the Republic of Serbia, issued by the Regulatory Agency for Electronic Communications and Postal Services in the name of the Supplier, valid on the date of the call for bids and on the date of contract award.</p> <ul style="list-style-type: none"> • Photocopy of Declaration of Conformity (CE).
<p>Fuel Consumption Detectors Documentation</p>	<p>Supplier shall submit the following documentation for Fuel Consumption Detectors:</p> <ul style="list-style-type: none"> • Technical documentation for fuel consumption detectors as per the requested technical specification. • Photocopy of Declaration of Conformity (CE).
<p>Aerosol Fire Extinguishing Equipment Documentation and Evidence</p>	<p>Supplier shall submit the following documentation for Aerosol Fire Extinguishing Equipment:</p> <ul style="list-style-type: none"> • Technical documentation for aerosol fire extinguishing equipment as per the requested technical specification. • Photocopy of the certificate of compliance with the EMC Electromagnetic Compatibility Regulation requirements (Official Gazette of RS no. 25/2016), issued by an Accredited Laboratory. • Photocopy of the certificate or License that the product is marked with the Green Label – GREEN LABEL. • Photocopy of the toxicological report that the extinguishing agent is non-toxic. • Photocopy of the certificate from an accredited EU institution like 'KIWA' or similar for extinguishing class A, B fires. • Photocopy of the confirmation that it is on the SNAP list of eco-friendly products. • Photocopy of the certificate that the products are manufactured in accordance with ISO 9001: 2015 and ISO 14001:2015 standards. • Photocopy of the certificate that it has a lifespan of at least 15 years. • Photocopy of the TUV certificate for generators proving their safety level and operational reliability (SIL level 2 and 3). • Photocopy of technical sheets, catalogs, or similar proving that the offered equipment fully meets the requirements in the tender documentation. • Photocopy of the confirmation that includes a 3-year fault warranty and a 5-year functionality warranty. • Photocopy of the compliance statement that products have the CE mark. • Photocopy of the declaration of compliance with the AS 4487-2013 standard requirements. • Photocopy of the certificate of conformity with the SRPS EN 15276 standard – fire extinguishing systems with condensed aerosol or equivalent. • Photocopy of the certificate of conformity for extinguishing class A, B, and E fires.

Application for tracking vehicles and monitoring fuel consumption	<p>Supplier shall submit the following documentation for application:</p> <ul style="list-style-type: none"> • Technical documentation for the software platform as per the characteristics requested in the technical specification. • Suppliers are required to submit a Declaration with proof of the existence of the application, including a link to the application and a specified demo access for checking the functionalities requested: real-time monitoring of equipment and fuel consumption detectors and the addition of automatic aerosol fire extinguishing in electrical cabinets. The demo access details should be stated in the Declaration.
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In addition to previous documentation, a Supplier who does not manufacture an item/s, the Supplier shall provide evidence of being duly authorized by a manufacturer (Manufacturer’s Authorization Form) issued by Head Quarters/Branch Offices or submit documentation on, its status as a supplier, to the satisfaction of the Purchaser (e.g. authorized dealer/ distributor of the items).

4. Project Site Specifications

1. **Location 1 - Belgrade, 6 Nemanjina Street, Headquarters of Serbian Cargo:** The Supplier is required to deliver desktop computers to this location, where acceptance will be conducted by the Purchaser and End Recipient. Additionally, the Supplier must activate the license for monitoring software.
2. **Location 2 - Supplier Premises:** The Supplier is responsible for the delivery and storage of equipment, where acceptance will be conducted by the Purchaser and End Recipient.
3. **Location 3 - Workshops in Subotica, Pančevo, Ruma, Požarevac, Kraljevo and Niš:** The Supplier is required to install monitoring equipment on available diesel locomotives at these locations. The installation timeline will be coordinated with the End Recipient, depending on the availability of locomotives at the time.
4. **Location 4 - Workshops in Belgrade and Niš:** The Supplier is required to install monitoring equipment on available electric locomotives at these locations. The installation timeline will be agreed upon with the End Recipient, subject to the availability of locomotives.

5. Inspections and Tests

5.1 Testing and Inspection Process

The testing process must include a thorough visual inspection of the delivered desktop computers and monitoring equipment, both prior to and during installation. This inspection aims to identify any potential damage that may have occurred during transportation or installation. Additionally, it will assess the types of installed components, ensuring their functionality and compliance with the specifications.

Acceptance tests shall be conducted following the delivery of the desktop computers, activated monitoring software and monitoring equipment. These tests are the responsibility of the Supplier, with the Purchaser and End Recipient providing reasonable support to facilitate the acceptance testing process.

The Purchaser and End Recipient reserves the right to refuse acceptance in cases where defects in the solution significantly impair its usability. Minor defects, which do not substantially affect the

solution's utility, shall be documented in the acceptance record. These defects must be remedied by the Supplier within a reasonable timeframe or as mutually agreed between the parties.

5.3 Operational Acceptance Certificate

Upon successful completion of the acceptance tests, the Supplier shall issue an Operational Acceptance Certificate. This certificate verifies the proper functioning of the equipment and must be signed by the Purchaser. The signing of this certificate by the Purchaser concludes the desktop computers and equipment testing phase.

5.4 Documentation and Software Access

The Supplier must furnish all necessary parameters, procedures, and access to the software and system/equipment to the Purchaser in both written and electronic forms. This submission should occur no later than the final day of job execution. It should encompass any form of software linking, configuration, programming, or customization, complete with associated licenses, codes, keys, passwords, or other necessary access restrictions, regardless of the system architecture (modules, drivers, applications, scripts, subprograms, programs, etc.).

5.5 Technical documentation, Completion Reports and Warranties

During the handover of each locomotive equipped with the monitoring system and upon its successful testing, the Supplier is required to issue a Taking-Over Certificate for every locomotive, that shall be signed by the Purchaser and End Recipient. The issuance of these certificates marks the commencement of individual warranties for each locomotive, which are tied to their respective installation dates as documented in the Taking-Over Certificate

The warranty period for equipment installed in locomotives, including services of installation, setup, and commissioning, shall be a minimum of 24 months. This warranty applies to all parts of the equipment installed on the End Recipient's locomotives. Upon request of the Purchaser and without additional costs, the Supplier is required to rectify any malfunction in the faulty equipment and replace it with functioning ones in cases where:

- The malfunction is a consequence of a defect in the equipment itself.
- The malfunction is a consequence of the Supplier's error during installation or configuration.
- The malfunction is due to a hidden defect.

During the warranty period, the Supplier is obligated, in up to five (5) working days and at their own expense, to restore all hardware and software to functional condition and perform repairs within the warranty period at the Project Locations where installation was carried out, without additional costs to the Purchaser. Following the intervention on the locomotive and equipment, it is the service provider's duty to conduct testing of the device operation and verify all functionalities.

The Supplier is required to provide comprehensive Technical Documentation by the final handover of the completely installed system in electronic form. This documentation should include technical specifications for each piece of installed equipment, software user manuals, and a warranty statement for the entire installed equipment.

Upon the completion of the entire implementation process, which includes the successive installation and commissioning of all equipment, and after conducting training sessions for the End Recipient's employees on the use of the system and the software operation, Supplier should prepare Final Completion Report. This report will document the comprehensive fulfillment of the contract obligations, detailing the execution of all tasks as per the contractual agreement. Additionally, at the conclusion of the complete implementation process, the Supplier must provide a Certification of the implemented technical protection system for all locomotives. This certification should align with the Regulation on performing technical protection jobs and using technical means, confirming

that all necessary adjustments, configurations, and software programming have been completed at the End Recipient's site.