

TECHNICAL SPECIFICATION

DESCRIPTION OF THE SUBJECT OF THE PROCUREMENT

1. DEFINITIONS

The Buyer is UAB Geležinkelio tiesimo centras.

The Supplier means an economic entity, including a natural person, private legal person, public legal person, other organisations and their subdivisions or a group of such persons, with whom the Buyer concludes the Contract.

Goods Locomotive Safety System (LSS).

Services means LSS design, installation and training services.

Contract means the Contract concluded between the Supplier and the Buyer on the Subject of the Contract.

2. PROCUREMENT OBJECT

2.1. Installation of a new safety system for Special Self-Propelled Rolling Stock (SSGR), including design, installation and training of personnel (hereinafter referred to as the '**subject of the procurement**').

2.2. The items and quantities of the Subject of the Contract are indicated in the table in Annex No. 1.

3. REQUIREMENTS FOR THE PROCUREMENT OBJECT

3.1. LSS functional characteristics:

3.1.1. Determination of the rolling stock speed and coordinates based on information from satellite navigation systems, speed and track sensors;

3.1.2. Generation of the speed limit and speed value using Automatic Locomotive Signalling (ALS), electronic map;

3.1.3. Provision of visual and/or audible information in real time to the on-board crew (driver and/or driver's assistant) to ensure traffic safety;

3.1.4. Assurance of automatic braking of the rolling stock movement when the instantaneous actual speed is higher than the permissible speed on the current section;

3.1.5. Elimination of the possibility of passing a prohibited traffic light or other signalling device;

3.1.6. Elimination of unauthorised rolling stock movement (derailment);

3.1.7. Monitoring driver vigilance;

3.1.8. Recording of vehicle movement parameters on a removable data logger;

3.1.9. Assurance of the safe operation of the rolling stock from cabs A and B in the travel direction (two-cab configuration);

3.1.10. Reliable operation of the LSS on lines with ALS equipment installed with signal coding frequencies of 25 Hz, 50 Hz and 75 Hz;

3.1.11. ALS signal current strength limits on rails:

1.4 A – 25 A AC on electrified sections;

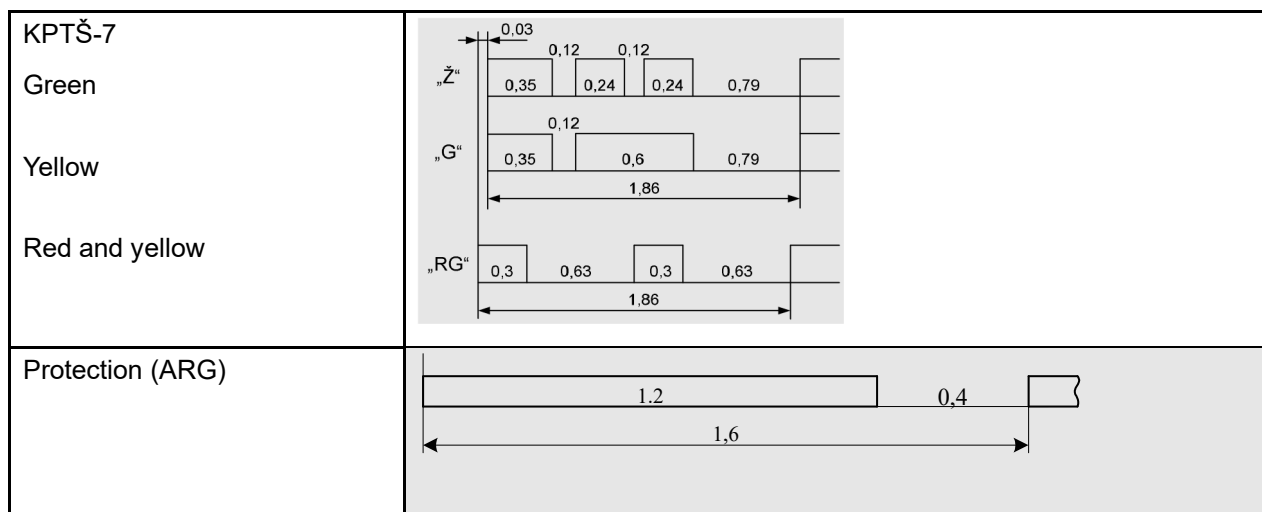
1.2 A – 25 A AC on non-electrified sections.

3.1.12. The parameters of the ALS signals shall be as specified in Table 1 of this Technical Specification;

3.1.13. The values of the harmonics of the traction current shall be as given in Table 2 of this Technical Specification.

2 1 Table.

ALS signal parameters	
Light (code being sent)	Pulse and interval duration, s
KPTŠ-5	<p>The diagram shows three signal waveforms labeled 'Ž', 'G', and 'RG'. Each waveform consists of a series of pulses and intervals. The durations are specified in seconds: 'Ž' has pulses of 0.03, 0.12, 0.12 and intervals of 0.35, 0.22, 0.22, 0.57; 'G' has pulses of 0.12 and intervals of 0.38, 0.38, 0.72; 'RG' has pulses of 0.23, 0.57, 0.23, 0.57. A horizontal double-headed arrow indicates a total duration of 1.6 seconds for the 'G' and 'RG' signals.</p>
Green	
Yellow	
Red and yellow	



2 Table

Harmonic values of the traction current			
Electrical power supply system	Signal current average frequency, Hz	Frequency band, Hz	Effective value of the current harmonic at continuous impact (more than 0.3 s), A, not more than
25 kV, 50 Hz	25	21-29	1.0
		15-21	4.1
		29-35	4.1
	75	65-85	1.0

3.2. The LSS must ensure:

- 3.2.1. Recognition of at least two out of three consecutive code signals of the same code;
- 3.2.2. Automatic or manual selection of the ALS signal frequency;
- 3.2.3. Functioning on both coded and non-coded lines. The transition from coded to non-coded sections may be automatic or manual, while the transition from non-coded to coded sections (in the case of ALS signals) is automatic only;
- 3.2.4. Activation of the on-board traffic light signal corresponding to the code signal being received;
- 3.2.5. Activation of the white light on the locomotive's traffic lights in the event of the loss of code signals or an unrecognisable signal if a Green or Yellow code signal has been received before;
- 3.2.6. Activation of the locomotive's red light in the event of the loss of code signals or an unrecognisable signal if a Red and Yellow code signal has been received before;
- 3.2.7. Activation of a momentary acoustic signal when the locomotive's traffic lights change;
- 3.2.8. Continuous control of speeding above 20 km/h when the red light of the locomotive's traffic light is on;
- 3.2.9. Continuous control of speeding when the red and yellow lights on the locomotive are on;
- 3.2.10. Change of the corresponding on-board traffic light display after a delay of three periods of the code signal sequence (5 to 6 seconds) when the incoming code signal changes or disappears;
- 3.2.11. Control of speeding of the rolling stock based on the ALS code signals received. If the vehicle exceeds the permissible speed according to the corresponding ALS code signal and no action is taken to reduce the vehicle speed to the permissible speed within 7 seconds, the vehicle brakes shall be applied;
- 3.2.12. Setting the permissible speed, taking into account the design speed and the permissible running speed set by the railway infrastructure manager for station and inter-station tracks;
- 3.2.13. Setting the permissible speed according to the values of the on-board traffic lights:
 - 3.2.13.1. Green light (Green code signal) on coded sections/white light on non-coded sections – maximum speed set by the railway infrastructure manager on station and inter-station tracks for the relevant type of vehicles;
 - 3.2.13.2. White light on coded sections – speed not more than 60 km/h;

- 3.2.13.3. Yellow light (Yellow code signal) – speed set by the railway infrastructure manager, taking into account the characteristics of the track, e.g. the speed set for crossing the turnouts;
- 3.2.13.4. Red and Yellow lights (Red and Yellow code signal) – speed to be determined by the railway infrastructure manager, taking into account the characteristics of the track and rolling stock, but not exceeding 80 km/h;
- 3.2.13.5. Red light – speed not more than 20 km/h;
- 3.2.14. Possibility for the driver to change the value of the locomotive's traffic lights from Red Light to White Light, and in the event of the loss of a code signal or an unrecognisable signal, the white light shall be switched on automatically;
- 3.2.15. Activation of the audible alarm when the vehicle exceeds the permissible speed and the vehicle's brakes must be applied if no action is taken to reduce the vehicle's speed to the permissible speed within 7 seconds;
- 3.2.16. Automatic braking of an unauthorised vehicle that is moving (has started moving);
- 3.2.17. Early warning to the driver when the vehicle reaches a speed close to the maximum permissible speed;
- 3.2.18. Ability to enter the data of the railway lines to be used (track number, traffic lights, speed limits, etc.). Based on the data stored in the LSS memory, the braking curves of the rolling stock shall be created and the brakes of the rolling stock shall be applied when the rolling stock exceeds the set permissible speed or the speed allowed in the braking curves;
- 3.2.19. Continuous monitoring of driver vigilance at certain intervals according to the ALS code signals (locomotive traffic light readings) received at vehicle speeds of 10 km/h and above;
- 3.2.20. if the vehicle is not equipped with an automatic driver vigilance control function, the driver vigilance shall be checked at regular intervals:
 - 3.2.20.1. Green light on coded sections/white light on non-coded sections or white light on coded sections in the event of loss of coded signals or an unrecognisable signal - at least 60-90 seconds;
 - 3.2.20.2. Yellow light for at least 60 to 90 seconds at speeds up to 80 km/h and at least 30 to 40 seconds at higher speeds;
 - 3.2.20.3. Red and yellow lights for at least 30-40 seconds;
 - 3.2.20.4. Red and yellow lights on station tracks for at least 15-20 seconds;
- 3.2.21. Recording and preserving key information;
 - 3.2.21.1. Driver identification data;
 - 3.2.21.2. Dates (year, month, day);
 - 3.2.21.3. Actual time;
 - 3.2.21.4. Train number;
 - 3.2.21.5. Rolling stock number;
 - 3.2.21.6. Type of vehicle;
 - 3.2.21.7. Length of the trainset (number of axles);
 - 3.2.21.8. Length of the trainset (in conventional wagons);
 - 3.2.21.9. Weight of the trainset (tonnes);
 - 3.2.21.10. Ordinates of the location of the rolling stock;
 - 3.2.21.11. Track number;
 - 3.2.21.12. Direction of travel;
 - 3.2.21.13. Distance travelled;
 - 3.2.21.14. Permissible speed limit;
 - 3.2.21.15. Actual speed;
 - 3.2.21.16. Locomotive's traffic light readings;
 - 3.2.21.17. Mode of operation (train/manoeuvre/dual traction);
 - 3.2.21.18. Air pressure in the brake line (brake cylinders);
 - 3.2.21.19. Availability of EAV power supply;
 - 3.2.21.20. EAV key position;
 - 3.2.21.21. State of the driver's control;
 - 3.2.21.22. Activation of the telemechanical driver vigilance monitoring system;
 - 3.2.21.23. Frequency of driver vigilance checks;

- 3.2.21.24. Driver's actions and ordinates for changes in the status of the LSS equipment (change of the locomotive's traffic lights, use of audible warning devices, etc.);
- 3.2.21.25. LSS interface language - Lithuanian, English.
- 3.2.22. Possibility of future expansion of the system for secure data reception and transmission over the GSM-R radio channel.

3.3. The following maintenance equipment shall be provided with the LSS to ensure the performance of the functions:

- 3.3.1. Emergency back-up set for restoring equipment operation (1 set).

3.4. Technical requirements

Item No	Technical and functional requirements	Characteristics
LSS set		
3.4.1.	Driver's display	LCD anti-vandal display with touch control (one display in each driver's cab);
3.4.2.	Registration block	Must ensure the recording of vehicle movement parameters, driver actions and diagnostic data in a removable data logger and in an internal non-volatile memory (one logging unit in each driver's cab);
3.4.3.	Movement Parameter Data Logger	For recording driver actions and diagnostic data;
3.4.4.	Vigilance buttons	Two buttons in each cab.
3.4.5.	Power units	For changing the input voltage of the on-board mains to the output voltage supplying the LSS components, electrical pneumatic equipment, discrete signal reception circuits;
3.4.6.	Pressure sensors	For measuring pressure in brake cylinders (one sensor), brake bus (one sensor), power bus (one sensor);
3.4.7.	Track and speed sensor or turning angle sensor	For determining speed and distance, mounted on the vehicle's axle box, installed 2 pcs;
3.4.8.	ALS signal receiving coils	For the reception of ALS code signals (two coils are installed at each end of the vehicle under the body, above the rail head);
3.4.9.	EAV – Electric Air Valve	For ensuring the automatic braking function.

3.5. LSS design, installation and staff training:

- 3.5.1. The Supplier must, throughout the entire term of the contract, hold valid and lawful rights to use, modify, and maintain the LSS software code and ensure the full functionality of the object of procurement, without infringing the intellectual property rights of third parties. Such rights may be based on ownership, a licence, an authorisation, or another lawful basis.
- 3.5.2. The installed LSS shall support software updates for the full duration of the system's operational life.
- 3.5.3. Protection of enclosures and equipment housings not lower than IP54 inside the driver's cab and not lower than IP56 outside.
- 3.5.4. Protection of safety-critical items from unauthorised access (sealing);
- 3.5.5. Vibration protection shall comply with EN 50155 or equivalent standards.
- 3.5.6. Electromagnetic emission level and immunity to interference of the LSS according to EN 50121-4AC or equivalent standards.
- 3.5.7. Electromagnetic compatibility of the LSS when operating on rolling stock in accordance with the requirements of EN 50121-3-1:2006 or equivalent standards.
- 3.5.8. The LSS or its components shall be durable, functional, reusable and/or easily repairable and/or replaceable.
- 3.5.9. The Goods/Services are subject to a warranty period of at least 24 (twenty-four) months.

4. DOCUMENTS SUBMITTED TOGETHER WITH THE TENDER

- 4.1. Name and full address of the manufacturer and/or its authorised representative (to be indicated on the Tender Form).
- 4.2. If the Contract does not require the submission of documents proving the conformity of the Products with the requirements, the Buyer shall have the right to require the submission of documents proving the conformity of the Products at any time during the execution of the Contract.

4.3. Supplier's declarations of compliance with national security requirements (Annexes V and VI to the Tender). When verifying the compliance of the Tender with the requirements of the Procurement Conditions, including the confirmations declared by the Supplier, the LTG shall be entitled to request from the Supplier other documents and data to substantiate the compliance with the requirements of the Procurement Conditions and the confirmations referred to in its declaration. To be submitted in electronic form.

4.4. The Supplier shall submit, together with the tender, a test report or certificate from a conformity assessment body established in the Republic of Lithuania, as an appropriate means of demonstrating how the equivalent products offered by the Supplier comply with the requirements or criteria set out in the Technical Specification, the criteria for evaluating tenders, or the terms and conditions of the Contract, and shall also recognise certificates issued by equivalent conformity assessment bodies established in other countries. If the Supplier is unable to obtain the certificates or test reports referred to above, or is unable to obtain them within the time limit due to circumstances beyond the Supplier's control, and proves by objective, written evidence that the products comply with the requirements or criteria set out in the Technical Specification, with the criteria for evaluating tenders, or with the conditions for the performance of the Contract, the Buyer shall accept other appropriate means. However, self-declarations by the Supplier, where the Supplier is not the manufacturer of the Goods, without specific, technical evidence are not considered to be adequate means (all evidence, certificates and other documents must be submitted with the tender).

5. DOCUMENTS SUBMITTED DURING THE PERFORMANCE OF THE CONTRACT

Item No.	Name	Content and format requirements	Moment of submission
5.1.	Documentation demonstrating compliance with the NFR (non-functional) requirements for information security and GDPR as set out in TS Annex 2.	Submitted electronically, in Lithuanian or English.	Submitted with each Product.
5.2.	User Guide for Offered Products	Submitted electronically, in Lithuanian or English.	Submitted with each Product.
5.3.	Passports/forms of goods containing the technical description of the LSS, with the exact name and serial numbers indicated on the LSS components	Submitted electronically, in Lithuanian or English.	Submitted with each Product.
5.4.	Instructions, operating descriptions, drawings, diagrams, descriptions and other explanations necessary for the operation, maintenance, repair and verification of the proper functioning of the LSS (including the Data Logger Decryptor),	Submitted electronically, in Lithuanian or English.	Submitted with each Product.
5.5.	LSS installation instructions.	Submitted electronically, in Lithuanian or English.	Submitted with each Product.
5.6.	Staff training programme.	Submitted electronically, in Lithuanian or English.	Submitted with each Product.
5.7.	Test programme and methodology.	Submitted electronically, in Lithuanian or English.	Submitted with each Product.
5.8.	Valid initial verification certificates for the LSS equipment subject to metrological verification.	Submitted electronically, in Lithuanian or English.	Submitted with each Product.
5.9.	LSS electromagnetic compatibility certificate.	Submitted electronically, in Lithuanian or English.	Submitted with each Product.
5.10.	Document certifying that the LSS has been tested and is suitable for use on an electrified railway (TNN, Annex 24, point 11).	Submitted electronically, in Lithuanian or English.	Submitted with each Product.
5.11.	Certificates of compliance issued to trained staff.	Submitted electronically, in Lithuanian or English.	Submitted with each Product.
5.12.	Software on a digital storage medium.	Submitted electronically, in Lithuanian or English.	Submitted with each Product.
5.13.	Deeds on transfer of goods/services.	Submitted electronically, in Lithuanian or English.	Submitted with each Product.

PERFORMANCE OF OBLIGATIONS

6. PROCEDURES FOR THE DELIVERY OF PRODUCTS / SERVICES

- 6.1. The installation of the SSGR security system will be carried on a separate order basis after the contract is signed. The Buyer undertakes to place an order for at least three vehicles, but does not undertake to place an order for the entire contract quantity.
- 6.2. The design of the LSS installation shall be carried out by the Supplier within 30 calendar days from order submission, after coordination of the necessary technical parameters and solutions with the Buyer, who shall provide all available technical documentation for the SSGR and unrestricted access to the SSGR in order to allow a proper evaluation of the scope of the future Services.
- 6.3. The LSS and its maintenance equipment shall be delivered to Geležinkelio g. 20, Šilėnai, Šiauliai district or Trikampio g. 10, Lentvaris (to be verified prior to delivery) for installation in the SSGR no later than 4 months from order submission.
- 6.4. The installation, training and static and dynamic testing of the LSS shall be carried out by the Supplier in accordance with a service schedule mutually agreed between the Supplier and the Buyer, but no later than 6 months after the entry into force of the Contract.
- 6.5. The installation of the LSS in the SSGR shall be carried out by the Supplier at the Buyer's technical base (Geležinkelio g. 20, Šilėnai, Šiauliai district or Trikampio g. 10, Lentvaris).
- 6.6. The Supplier shall provide a training programme for the Buyer's staff no later than 3 months after the entry into force of the contract.
- 6.7. The Supplier shall, in accordance with a schedule mutually agreed between the Supplier and the Buyer, but no later than 15 calendar days after the installation of the LSS in the SSGR, train the Buyer's personnel (SSGR drivers and service personnel, at least 20 employees) to operate, service and repair the LSS independently, and shall issue the certificates of conformity to the trained personnel.
- 6.8. The Supplier shall not be entitled during the performance of the Contract to supply products or services which do not comply with the requirements of the Procurement Documents and/or the supply of which is restricted due to international sanctions (as defined in the Law on International Sanctions of the Republic of Lithuania) and/or due to their threat to the national security, as defined in the Procurement Documents and in the Republic of Lithuania Law on Public Procurement/ the Republic of Lithuania Law on Procurement by Contracting Entities in the Water Management, Energy, Transport and Postal Services Sectors.
- 6.9. The Supplier must inform the Buyer in writing (by e-mail) of the country of origin of the Products ordered and the manufacturer of the Products (name, legal entity code, country of registration) no later than within 1 (one) working day after receipt of the order, before the order is fulfilled. The provision of this information shall be included in the lead time.
- 6.10. The Supplier shall deliver a test programme and methodology agreed in advance with the Buyer no later than 30 calendar days after the entry from order submission.
- 6.11. After the installation of the LSS in each SSGR unit, static and dynamic tests of the LSS shall be carried out on the Lithuanian railway infrastructure within a maximum of 15 calendar days.
- 6.12. The test drives shall be carried out in accordance with a test drive programme drawn up by the Supplier and agreed in advance with the Buyer.

7. PROCEDURES AND DEADLINES FOR RECTIFYING DEFECTS

- 7.1. Defects in the Goods/Services must be rectified no later than within 30 (*thirty*) calendar days from the date of the Buyer's e-mail notification.
- 7.2. If the last day of the period for rectifying defects in the Goods/Services falls on a day other than a working day or public holiday, the end of the period shall be deemed to be the following working day. Public holidays and non-working days (Saturdays and Sundays) shall be counted as part of the period for rectifying defects in the Goods/Services.
- 7.3. During the test runs, all technical and system deficiencies in the LSS shall be addressed by the Supplier.

8. ANNEXES

- Annex 1 - Items and quantities of the subject of the procurement
- Annex 2 - NFR requirements for information security and GDPR
- Annex 3. Environmental (green) criteria