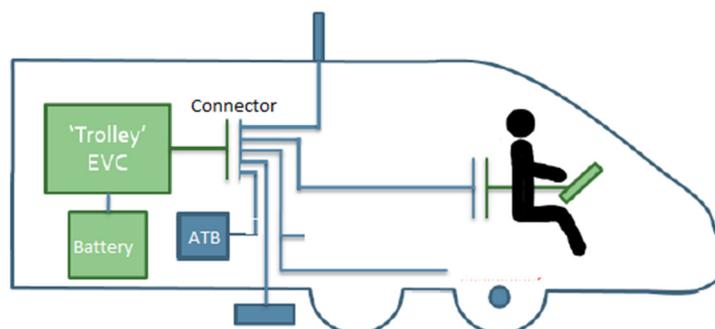


Market consultation

ERTMS – Towards an economic solution for incidental movement of vehicles without ERTMS over ERTMS infrastructure (VVZE)



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This document is a translation of the Dutch version ref.: IEMEV0YF-607718390-263.
 An English translation of the Dutch version has been made available for market parties participating in this market consultation. In the event of unexpected discrepancies, the original Dutch version shall in all cases have precedence.

1 Market consultation economic ERTMS solution VVZE

1.1 Introduction

The ERTMS VVZE market consultation is a collaboration between ProRail and railway companies in the ERTMS Program. In this program, the ERTMS Program Directorate coordinates the introduction of ERTMS in the Netherlands by transporters, equipment owners and infrastructure manager ProRail. It does this on behalf of the Ministry of Infrastructure and Water Management and in close collaboration with all parties involved. The ERTMS Program Board is part of ProRail B.V.

The European Rail Traffic Management System (ERTMS) is the European standard for train protection. Systems based on this standard will serve as a replacement for the current ATB (Automatic Train Protection) system. The advantages of ERTMS lie in the areas of safety and interoperability, as well as in capacity, speed and reliability.

This market consultation for, in particular, railway undertakings other than Nederlandse Spoorwegen (NS) is led by ProRail in collaboration with IEMeV (hereinafter: initiators). IEMeV is a division of the ERTMS Program Organization. The main task of IEMeV is to support the railway undertakings, not being NS, during the transition from ATB to ERTMS in such a way that both the objectives of the ERTMS Program and those of the railway undertakings are met.

The primary objective of the market consultation is to gain insight into all possibilities for acquiring a solution for incidental vehicle movement over ERTMS infrastructure (VVZE), resulting in an economic temporary ETCS 'on board' solution.

Initiators ask market parties experienced in the development of safety systems SIL3 / SIL4 for answers to defined questions regarding the topic VVZE for an economic temporary ETCS solution 'on board'. This concerns in particular aspects relating to the comprehensibility and feasibility of the requested solution. Ideas for improvement are also requested from the market parties. In this way, initiators can come to a common understanding of the possibilities in the market, set high quality requirements and shorten the lead time for possible tenders. Initiators believe it is important to obtain concrete information from those market participants who are capable of or have experience in providing or developing an economic temporary ETCS solution for use with rail vehicles.

1.2 Objective

This document contains all relevant information for the ERTMS VVZE market consultation: the process of the consultation, its conditions and more detailed information about the topic.

Initiators would like to clearly state that in this phase no parties will be selected. No rights may be derived from this document and/or participation in this market consultation within the framework of the possible future tender. Completion of the questionnaire is mandatory but if not, will not result in admission or exclusion in any possible future tendering procedure.

Initiators request market players only to respond to this market consultation when they are capable or have experience in delivery of a VVZE Solution, as further detailed in chapter 2 of this document.

1.3 Scope

The scope of the intended assignment primarily consists of either delivery and implementation or development, delivery and implementation of a VVZE Solution with possible supported services.

1.4 Structure

Chapter 2 contains more detailed content relating to the topic of the market consultation plus a questionnaire and in chapter 3 we provide an explanation of the market consultation procedure and rules of engagement. The appendices contain a concept design specification and the questionnaire (Excel).

2 Economic ERTMS solution for vehicles without ERTMS (VVZE)

2.1 Introduction

The ERTMS Program is working on the introduction of the European train protection system ERTMS in the Netherlands. The initial rollout concerns part of the HoofdRailNet (HRN, main railway infrastructure) and since the infrastructure is being implemented as "ERTMS-only", all movements of rolling stock on these lines must take place under ETCS. This includes rail vehicles that do not come into contact with ETCS in its primary area of use, such as vehicles used by regional public transport operators, shunting locomotives, contractors' equipment (OTM's, Yellow Fleet) and historical vehicles (Black Fleet).

Given the more incidental nature of the interaction with ETCS of these vehicles, it is possible to explore other (technical) solutions as an alternative to the full ETCS conversion of these vehicles, as such alternatives are more cost effective and therefore significantly lower investment require from the vehicle owners. In addition to the product price, a small footprint and low design and release costs are important when using the product. This is because there is often very limited installation space and because it often concerns unique or very limited series of a type of a vehicle.

In consultation with vehicle owners and on the basis of cost figures, a comparison has been made between possible solutions for the Relocation of Vehicles without ETCS over ETCS track sections (hereinafter: VVZE, acronym in Dutch) that could be commercially feasible. The following were taken into consideration: technology, method of implementation, costs and benefits.

2.2 Solution alternatives and application variants

As possible solutions for VVZE as an alternative to full ETCS conversion, the following solutions were investigated in the period 2018-2019:

- "ETCS taxi": for the VVZE trips a taxi is used, this is a locomotive that is equipped with ETCS and pulls the relevant vehicle..
- "ETCS wagon": all ETCS facilities are brought together on a wagon that is coupled to the vehicle.
- "ETCS trolley": all ETCS equipment is placed in a mobile trolley which is placed and connected in the vehicle for VVZE displacement.
- "EVC Tablet": a portable variant of the trolley with which VVZE movements can be carried out under certain conditions.

The "ETCS taxi" and "ETCS wagon" have proved insufficiently attractive from an operational point of view and cost considerations. This is mainly due to the complexity in the operation with shunting movements and the related capacity loss of capacity and the high cost of a deployment.

This market consultation therefore focuses on the "EVC trolley" and the "EVC tablet". These solutions only slightly limit the operation.

The intended benefit in costs arises from:

- Limiting the number of required ETCS On Bord Units (OBU) for a fleet by temporarily installing them in a rail vehicle when an ETCS track is to be driven.
- Simplification of the OBU configuration or use of an industrial hardware platform.
- Application of compact STM-ATB or re-use of an existing ATBL-NL or ATB-E installation.
- Reuse of the existing shaft generators used for the ATB installation and their cabling.
- Reuse of the existing brake valves used for the ATB installation and their cabling.
- Simple standardized engineering rules for all equipment as part of the GPSC, including reuse of existing periphery and simple odometry.
- Acceptance after conversion of the equipment based on a simple acceptance protocol that is part of the GPSC.
- Expected to be a simple transition from old to new situation in the licensing procedure: as a result of the installation of the interface connector, GPS, GSM-R and balise antennas, no substantial change has been made to the ATB installation. There is a substantial change after the actual (temporary) installation and connection of the "ETCS trolley" or the "ETCS tablet"; this placement and connection may be carried out after authorization for the modified vehicle, including installed temporary equipment, has been granted.

It is important to have knowledge of the fact that only 2 versions of ATB train equipment are used in the Netherlands: ATBL-NL (produced by Alstom) and ATB-E (produced by Strukton). This makes it relatively easy to determine standard solutions for the train interface. The installation instructions for both systems are available.

2.2.1 ETCS trolley

Characteristics

With the ETCS trolley, most ETCS parts are housed in a mobile tool trolley ('trolley'), possibly with its own power supply (accumulator). This is connected to the systems built into the train. The DMI is also portable and is connected in the cabin to the connector fitted there. Supports ERA specifications BL3.

A preliminary design (CDS) of the ETCS Trolley is included as annex A of this market consultation document.

Equipment

The train is permanently equipped with a GSM-R antennas, a balise reader (two for EMU/DMU), a cable to the cabin for the DMI connection and connection to dead man, odometry and braking systems. All other ETCS parts are housed in the mobile unit.

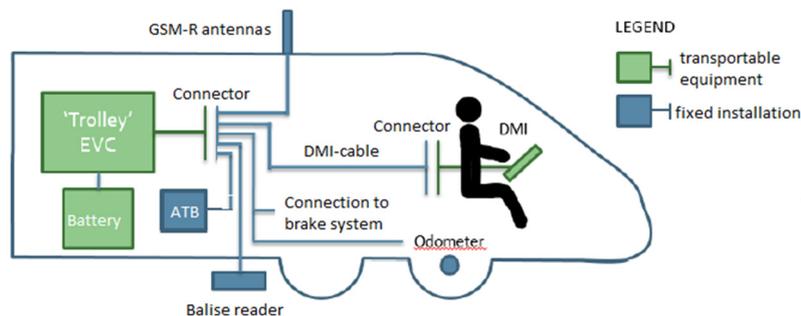


Figure 1 Schematic representation of the ETCS trolley; the battery can be a part of the fixed installation

Application

The ETCS trolley provides full ETCS functionality with limited fixed facilities in the vehicle.

2.2.2 ETCS-tablet

Characteristics

The EVC tablet solution is a portable solution that can be taken on the train by the train driver.

This solution is essentially an industrial safety computer with integrated DMI that connects to a number of basic facilities that are already built into the vehicle. Preferably it is based on a "rugged" COTS tablet.

The EVC tablet is a kind of ETCS light variant because not all systems and redundancy are provided. The EVC tablet is therefore designed for more incidental trips with additional requirements, comparable to the current ATB-E regime. Supports ERA specifications BL3.

Equipment

The portable solution is connected to a fixed connection available in the cabin. On the train in which this solution is applied, an integrated GSM-R and GPS antennas and a counter reader are fitted. It is connected to the existing odometry and braking systems. In principle, the energy supply of the train is used.

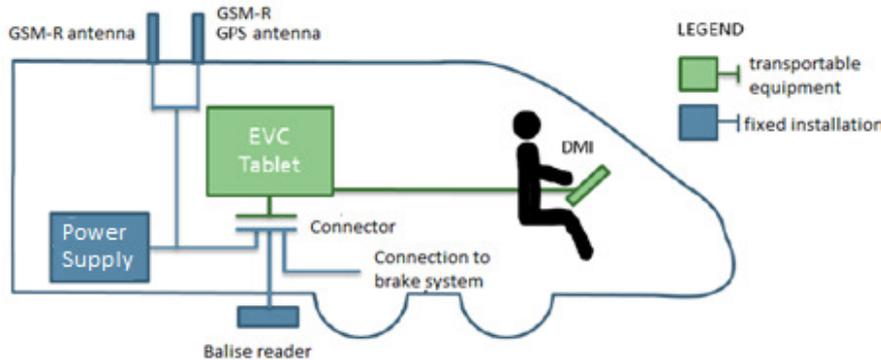


Figure 2 Schematic representation of the ETCS tablet

Application

The EVC tablet solution is particularly suitable for incidental movements comparable to the conditions of the current ATB-E conditions. The solution requires minimal modifications to the vehicles.

2.3 Applicable regulations and standards

National laws and regulations:

- Spoorwegwet; national railways act.
- Regeling Indienststelling Spoorvoertuigen; national rules in addition to TSI's for placing railway vehicles into service.

- Wet Beveiliging Netwerk- en Informatiesystemen (Wbni) voor Digitale dienstverleners; national cybersecurity act¹.
- Besluit Beveiliging Netwerk- en Informatiesystemen (Bbni); national cybersecurity regulation.
- Subsidieregeling ERTMS, 2019, nr. IENW/BSK-2018/261650; national subsidy scheme.

European laws and regulations:

- 2016/919/EC and 2019/776/EC, TSI-CCS rectified
- 1302/2014/EU, TSI LOC & PAS.
- 402/2013/EU, CSM-RA.
- 2010/713/EU, Commission Decision on modules for the procedures for assessment of conformity, suitability for use and EC verification.
- 2018/545/EU, Commission Implementing Regulation establishing practical arrangements for the railway vehicle authorisation and railway vehicle type authorisation process pursuant to Directive (EU) 2016/797.
- 2016/798/EU, Directive on railway safety
- 2016/797/EU, Directive on the interoperability of the rail system.
- 1078/2012/EU, Commission Regulation (EU) No 1078/2012 of 16 November 2012 on a common safety method for monitoring to be applied by railway undertakings, infrastructure managers after receiving a safety certificate or safety authorisation and by entities in charge of maintenance.
- 2011/65/EU, RoHS, Directive on the restriction of the use of certain hazardous substances in electrical and electronic equipment.
- 1907/2006/EU, REACH, Regulation concerning the Registration, Evaluation, Authorisation and Restriction of Chemicals.
- 66/2006/EU, Directive on batteries and accumulators and waste batteries and accumulators

Standards:

- EN 50125-1; Railway applications - Environmental conditions for equipment - Part 1: Rolling stock and onboard equipment.
- EN-50126; Railway Applications - The Specification and Demonstration of Reliability, Availability, Maintainability and Safety (RAMS), Sys engineering.
- EN 50155; Railway applications - Rolling stock – Electronic Equipment.
- EN 50215; Railway applications - Rolling stock – testing of rolling stock on completion of construction and before entry into service.

2.4 Abbreviations and terms

Abbreviation / term	Meaning/ definition
ATB	Automatische trein beïnvloeding (Dutch), system for automatic train protection as used in the Netherlands.
ATB-E	ATB Eenvoudig (Dutch), designation for simplified ATB train equipment used in on track machines and historical equipment.
BL3	Baseline 3 Set of Specifications #2 (SRS 3.4.0) of Set of Specifications #3 (SRS 3.6.0) as described in Annex A of TSI/CCS.

¹ The railways will be incorporated into the WBNI Act in mid-2020, the measures will be implemented as of 1/1/2021.

Abbreviation / term	Meaning/ definition
CDS	Concept Design Statement.
DMU	Diesel multiple unit, self-propelling multi coach vehicle intended for passenger transport.
EMU	Electrical multiple unit, self-propelling multi coach vehicle intended for passenger transport.
ERA	European Union Agency for Railways.
ERTMS	European Rail Traffic Management System.
ETCS	European Train Control System.
HRN	HRN, Hoofdrailnet (Dutch), main railway infrastructure
OTM	On track machine, term used by ERA for rail vehicles for track construction and maintenance; the group is referred to as contractor equipment.
RIS	Regeling indienststelling spoorvoertuigen (Dutch). Regulation of the Minister of Infrastructure and the Environment, laying down rules with regard to the placing in service of railway vehicles on main railway infrastructure.
retrofit	Installing equipment on previously approved equipment to make it suitable for ERTMS BL3.
SIL	Safety integrity level, ranked from 0 to 4, 4 is the highest level.
spoorvoertuig	Spoorvoertuig (Dutch), vehicle intended for traffic on railways as referred to in the Railways Act
STM-ATBEG	Specific Transmission Module ATBEG. National adapter module for ERTMS train equipment to run on infrastructure without ERTMS but with ATBEG
TSI	Technical Specifications Interoperability
TSI-CCS	Technical Specification for Interoperability - Command Control Signalling
type	Designation by ERA intended to designate an identical group of rail vehicles
VVZE	Verplaatsen van Voertuigen Zonder ETCS over ETCS-baanvakken (Dutch), Moving Vehicles Without ETCS over ETCS track sections.

2.5 Questionnaire

Our questions are included in the questionnaire Appendix B. You are requested to use this Excel format when answering.

In addition, attachments containing your proposals may be included. You are required to refer to these appendices in the questionnaire by indicating the document reference.

3 Procedure of the market consultation

3.1 Approaching to the market players

This document has been published on TenderNed and on the website www.ertms-nl.nl of the Program ERTMS. Market players with knowledge and experience with regard to the development and application of safety systems at level SIL3 / SIL4 are requested to respond to this invitation. Insight in this market is of great value for the possible future tender procedure and much appreciated.

3.2 Process

Market players are requested to register for their participation in this market consultation in writing, before the date mentioned in section 3.3, to the following email address: menno.bronswijk@prorail.nl

The market consultation consists of a number of steps. If it proves to be suitable with regard to experience and references, an invitation to the (virtual) kick-off will follow. After the kick-off, there is another period in which you can ask questions. You are then requested to send the completed questionnaire (Annex B) and accompanying documents (for example your product documentation) to us.

Based on the answers and accompanying documents, different participants can be invited to participate in an individual, in-depth conversation.

3.3 Planning

Below is a summary of the dates aimed for this market consultation:

Date	Activity by interested market player	Activity by Initiators
9 th of June 2020		Publication of the market consultation on TenderNed and the ERTMS Program website www.ertms-nl.nl
16 th of June 2020 16.00 CET	Deadline registration participation for the kick-off of the market consultation	
18 th of June 2020		Possible invitation to participate in the kick-off of the market consultation
22 th of June 14.00 CET	Joint kick-off with explanation of process and discussion of problem definition (Microsoft Teams meeting)	
24 th of June 2020 16.00 CET	Deadline for written questions concerning the consultation documents	
26 of June 2020		Deadline for answering the written questions

Date	Activity by interested market player	Activity by Initiators
29 th of June 2020 16.00 CET	Closing of the submission deadline for written answers	
8 th and 9 th of July 2020	Individual consultation with suppliers (Microsoft Teams meeting)	
September 2020		Provide final report to all participants of the market consultation

3.4 Rules of the market consultation

Initiators have set out the following conditions pertaining to this market consultation

- This market consultation is explicitly not part of the possible procurement procedure that may follow;
- Expressly no rights may be derived from the information that is provided for the purpose of the market consultation;
- As a result of participating in this market consultation, participants will not be given any preferential status with respect to the possible procurement procedure, nor will participation lead to exclusion from such a possible procedure;
- The market consultation is voluntary, no rights can be derived from the (insights resulting from) the market consultation;
- For the time being, the target group for the market consultation is limited to private market parties with knowledge and experience with regard to the development and application of safety systems at level SIL3 / SIL4 are requested to respond to this invitation;
- The following parties are among those excluded from participation in this market consultation: public entities, interest groups, private individuals, the press and knowledge institutions;
- Parties that can be characterized as the aforementioned target group may request an individual market consultation with the ERTMS program directorate. Depending on the nature of the request, the program may proceed to grant such a request. All information exchanged between the ERTMS program directorate and the participating party during the market consultations will be made public, unless commercially sensitive information (to be indicated by the participating party and decided by the ERTMS program directorate) has been shared.
- Initiators will draft an overall report of the main points of all of the individual market consultation meetings. This report will be made public (anonymous and without any commercially sensitive details);
- The primary language of the market consultation will be English or Dutch;
- Participation in a market consultation takes place on a voluntary basis;

no compensation will be provided for participation and no compensation will be provided for expenses arising from participation;

- By participating in a market consultation, the parties unconditionally agree to the aforementioned conditions;
- In light of measures regarding COVID-19, meetings shall be held with use of Microsoft Teams;
- All communication regarding the market consultation, and submission of answers and/or reply forms, must take place via the following contact:

Menno Bronswijk, Tendermanager ICT

Mail : menno.bronswijk@prorail.nl

Tel : +31 6 18 72 90 06

Annexes

- Annex A VVZE CONCEPT DESIGN STATEMENT TEMPORARY ON-TRAIN ETCS EQUIPMENT “ETCS-Trolley”, CSFTUN7FJNPT-1548898944-122, v5.3, January 29th 2020
- Annex B Questionnaire MC VVZE, IEMEV0YF-607718390-259, v1.0, June 4th 2020