EUROPEAN UNION AGENCY FOR RAILWAYS

Making the railway system
work better for society.

Light Impact Assessment

TSI ENE – Closure of open point on interface protocols between energy measuring system (EMS) and data collecting system (DCS)

	Elaborated by	*Validated by*	*Approved by*
Name	W. Malfait S. Lis I. Ballester	A. Harassek O. Gherginescu	J. Engelmann
Position	EEV Project Officer IU Project Officers		
Date	15/06/2017	26/06/2017	
Signature			

Document History

Version	*Date*	*Comments*
V0.1	21/06/2017	

Contents

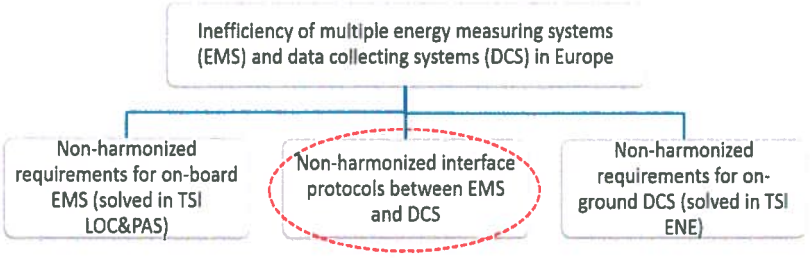
1. Context and problem definition

1.1. Problem and problem drivers

Problem: Inefficiency of multiple interface protocols between energy measuring systems (EMS) and data collecting systems (DCS) in Europe.

Causes:

1. non-harmonized requirements for on-board EMS – solved by existing LOC&PAS TSI (out of scope of this IA)
2. non-harmonized requirements for on-ground DCS – solved by the existing ENE TSI (out of scope of this IA)
3. specs related to interface protocols between EMS and DCS are not harmonized (in scope of this IA - open point in TSI ENE).



See extract of current TSI ENE:

4.2.17. On-ground energy data collecting system

(1) Point 4.2.8.2.8 of LOC & PAS TSI contains the requirements for on-board Energy Measuring Systems (EMS) intended to produce and transmit the Compiled Energy Billing Data (CEBD) to an on-ground energy data collecting system.

(2) The on-ground energy data collecting system (DCS) shall receive, store and export CEBD without corrupting it.

*(3) **The specification related to interface protocols between EMS and DCS and transferred data format are an open point**, which, in any case, shall be closed within 2 years after the entry into force of this Regulation.*

Consequences of the problem: additional burden for cross-border operating vehicles. The main problem is the potential risk and increased number of national (proprietary) solutions for on-board energy metering systems across Europe which will affect cross-border operating vehicles.

Problem-driver of the open point:
There are no particular problem drivers for closure of this open point. The main reason of not having closed the open point in the previous TSI ENE revision is because the solution proposed in the EN 50463:2012 was a proprietary solution and by consequence an agreement could not be reached to set out common requirements for interface protocols between EMS and DCS and transferred data format.

<table>
<tr><td>1.2. Main assumptions</td><td>Out of scope:
- the requirements related to the implementation of the on-ground settlement system are already part of the TSI ENE and are out of scope of this analysis (see point (3) above);
- the requirements related to the implementation of the EMS (energy metering system) at vehicle side are already part of the TSI LOC&PAS and are out of scope of this analysis;
- the migration scenario is out of scope. It is up to the Member State to decide if the support of on-board national energy metering systems on existing vehicles will be maintained or not.</td></tr>
<tr><td>1.3. Stakeholders affected</td><td>
<table>
<tr><th>Category of stakeholder</th><th>Importance of the problem</th></tr>
<tr><td>RU</td><td>3 - Medium</td></tr>
<tr><td>Suppliers</td><td>2 – Medium</td></tr>
<tr><td>IM</td><td>2 – Medium</td></tr>
</table>
- The estimated number of cross-border operating vehicles requiring multiple national on-board systems is not available, however the trend is that renewed, upgraded or new vehicles shall be equipped with an EMS. Therefore, it is important that these on-board meters can be used in the different EU Member States.

The estimated number of cross-border operating vehicles is estimated at 6.000 (10% of 60.000) vehicles. Assuming a lifetime of 30 years, this gives a rough estimation of 200 new vehicles impacted per year if no standardised solution is envisaged. Assuming that on-board energy metering is becoming a standard functionality and assuming a 10kEUR additional cost impact without harmonised interoperability function, this gives an overall minimum magnitude of the problem of 2 MEUR/year (not taking into account a more open market, renewal or upgrade of vehicles).

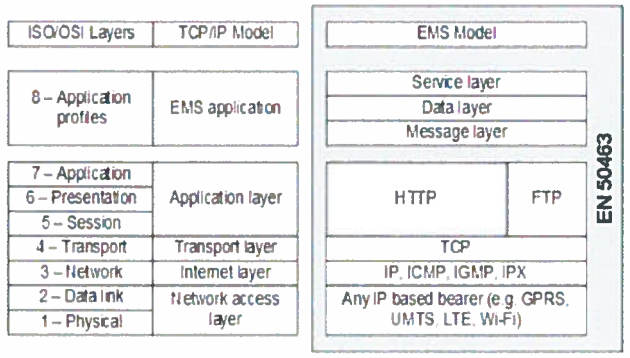
- Suppliers: number of existing products/solutions for settlement systems/on-board energy metering : 6
(see confidential data - ERA database)

- IMs/RUs: estimated number of settlement systems implemented in the 25 MS/IM: +/-10;</td></tr>
<tr><td>1.4. Evidence and magnitude of the problem</td><td>The estimated number of different product solutions for settlement systems across Europe is 6 of which some solutions are being used in more than 1 Member State.</td></tr>
<tr><td>1.5. Baseline scenario</td><td>Risk of maintaining or increasing the number of proprietary solutions for settlement systems and on-board energy metering systems.</td></tr>
<tr><td>1.6. Subsidiarity and proportionality</td><td>The Agency is defining the EU interoperability requirements (TSIs).</td></tr>
</table>

2. Objectives

2.1. Strategic and specific objectives	*Mark, as appropriate, **the strategic objective(s) of the Agency** with which this initiative is coherent.* ☐ Europe becoming the world leader in railway safety ☐ Promoting rail transport to enhance its market share ☒ Improving the efficiency and coherence of the railway legal framework ☐ Optimising the Agency's capabilities ☐ Transparency, monitoring and evaluation ☒ Improve economic efficiency and societal benefits in railways ☐ Fostering the Agency's reputation in the world *What are the **specific objectives** of this initiative? (The objectives should be as S.M.A.R.T. as possible.)* Increase efficiency of the interface protocols between EMS and DCS at EU level to contribute to interoperability for cross-border RUs and to open market for settlement systems (DCS) and energy measuring systems (EMS);
2.2. Link with Railway Indicators	RI 2.1 Evolution of the applicable national technical rules for vehicles: All national technical rules related to EMS should be deleted by 2020.

3. Options

3.1. List of options	Baseline: No closure of open point (continued use of proprietary solutions) Option 1: Use of EN50463 (solution based on open standard .xml; multi bearer connection > EN61375 + dedicated wireless connection)
3.2. Description of options	Baseline: Continued use of multiple proprietary solutions across EU Option 1: Use of EN50463 (solution based on open standard .xml; multi bearer connection > EN61375 + dedicated wireless connection) Note 1 on consistency radio systems for critical applications (GSM-R and its successor (FRMCS): The FRMCS will investigate the feasibility to extend the use of EN61375 for critical data as part of on-board architecture (e.g. use of priority handling of applications). Note 2 on vehicles not compliant to EN61375-2-6: the additional possibility to use dedicated wireless connection shall facilitate the migration for existing vehicles not being compliant to the EN61375-2-6. 1524 Figure 30 shows the architecture which fulfils the dedicated wireless connection. The identification of 1525 the stack layers is shown on the left. The dedicated wireless connection solution shall be compliant with 1526 the stack on the right. The HTTP and FTP services shall be supported by TCP or other equivalent 1527 protocol.  1528 1529 **Figure 30 — Dedicated wireless connection** 1530 NOTE 1 GPRS bearer covers GPRS or GPRS-R. 1531 NOTE 2 Wi-Fi indicates the bearers specified in IEEE 802.11–2007
3.3. Uncertainties/risks	National requirements: risk of metrological national requirements (imposed by energy market) on top of TSI ENE requirements.

4. Impacts of the options

4.1. Impacts of the options (qualitative analysis)

Category of stakeholder	*Impacts*	*Option 1 (compared to baseline)*
Suppliers	Positive impacts	TSI requirements will increase the potential market volume and standardisation will decrease the development costs due to avoidance of national rules
	Negative impacts	Migration of existing products: 100kEUR/existing product (order of magnitude) (see confidential data - ERA database) **Overall development costs: 1 MEUR for the 6 existing settlement systems on ground systems**
IMs	Positive impacts	Open market: standardization will decrease the product costs for the new settlement systems
	Negative impacts	IMs will pay the costs for development of new DCS-settlement systems when purchasing the settlement systems or services (see 1 MEUR above). This development cost of new DCS settlement system is the main cost driver for IMs/entity in charge of operating the system as installation costs are mainly linked to the upgrade of software of the settlement system
RUs	Positive impacts	Avoidance of installation of multiple national on-board meters on cross-border operating vehicles. **Expected minimum interoperability positive impact of 2 MEUR/year.**
	Negative impacts	Potential risk of migration costs for existing vehicles if IMs mandate the TSI solution for existing already equipped vehicles.

			Estimated number of EMS installed on vehicles: max. 10k IMs with high number of installed EMS operating on their network could provide a dual trackside solution during a sufficient long migration period.

5. Comparison of options and preferred option

5.1.	**Effectiveness criterion (options' response to specific objectives)**	<Based on the findings from section 4.1, assess the extent to which the various options respond to the specific objectives, from 1-very low response to 5-very high response and calculate the average score (**effectiveness**).>

	Option 0 (baseline)	*Option 1*
Interoperability (RUs)	2 (6 suppliers for 10 clients)	5
Open market for settlement system and EMS	3	4
Overall score	**2.5**	**4.5**

5.2.	**Preferred option(s)**	Option 1
5.3.	**Further work required**	/

6. Monitoring and evaluation

6.1.	**Monitoring indicators**	Monitor implementation of TSI compliant settlement systems and existence of national metrological requirements (involvement of DG ENER). Monitor the number of suppliers providing TSI ENE compliant settlement systems.
6.2.	**Future evaluations**	/