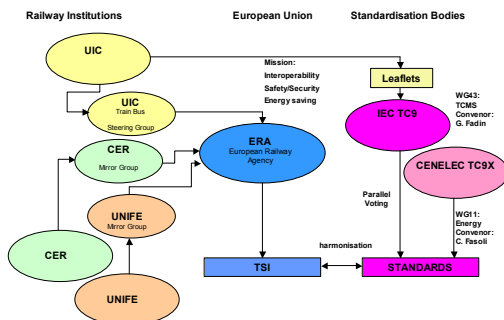


Standardisation activity in Europe. Towards a fully compatible vehicle and onboard energy management system

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- A large rolling stock fleet of conventional vehicle is on service in the Central and Eastern European Countries (CEEC).
- The liberalisation of the market is asking for competition
- The base for competition is the Trans-European conventional rail system
- The European Rail Agency (ERA) has addressed the interoperability issues launching the preparation of the Technical Specification for Interoperability (TSI) covering the following areas:
 - Infrastructure
 - Energy
 - Locomotives and traction units
 - Passenger carriages



STANDARDISED COMMUNICATION between Vehicles

IEC TC9 WG43: Train communication Network

- New Vehicle busses
- UIC communication leaflets
- Broad band train bus

UNIFE TCMS Mirror Group

- TCMS and broad band train bus
- Deliverables to ERA and WG43

CER - ET5

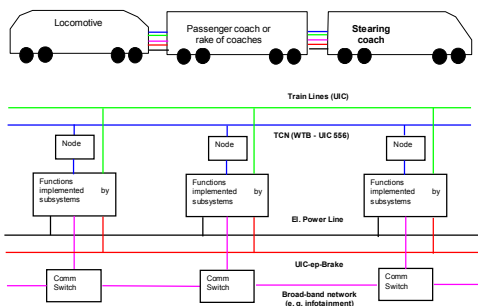
- Communication interfaces between compatible vehicles
- Deliverables to ERA

CENELEC

- Parallel voting on TCN

ERA

- TSI



Information is divided in 3 categories:

- Safety-related information
- Operational information
- Non-operational information (e. g. infotainment)

3 Onboard information transmission channels/interfaces:

- Trainline(s)
- Train-bus
- Broadband-network

STANDARDISATION AND REGULATION ACTIVITIES

ENERGY METERING, BILLING and SAVING

CENELEC TC9X WG11

- prEN50463 "Railway applications - Energy measurement on board of trains"
- EN50463
- Enlargement of the SCOPE

UIC RailEnergy

- Research project
- deliverables will be sent to CENELEC and ERA

UNIFE

Set up of a Mirror Group or Topical Group

ERA

- TSI

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TEMS – Train Energy Management System

CENELEC STANDARDISATION

ACTUAL STATUS

- TC9X WG11 has developed the document EN50463 "Railway applications - Energy measurement on board of trains".
- The document was issued as prEN50463 and is now under the 6 months enquiry.
- It is expected the final approval for June 2007 when the norm will be issued as EN50463.

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TEMS – Train Energy Management System

CENELEC STANDARDISATION – ACTUAL STATUS

FUNCTIONAL BLOCK DIAGRAM OF ONBOARD METERING DEVICE

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TEMS – Train Energy Management System

CENELEC STANDARDISATION – ACTUAL STATUS

MAIN TOPICS of the prEN 50463

Multi-system capability meter (25 kV-50Hz, 15 kV-16,7 Hz, d.c.)

Main requirements for output data:
Locomotive identification, time-energy, energy recovered

Related information for output data:
Train location-time, energy peak in a definite time, continuous or discontinuous data, auto-diagnostic alarms, service messages

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TEMS – Train Energy Management System

CENELEC STANDARDISATION – ACTUAL STATUS

MAIN TOPICS of the prEN 50463

Energy time reference :
Load profile recorded shall be selectable for 5, 10 and 15 minutes

Other features :

- suitable for fiscal use,
- optional display,
- communication by GSM, GPRS, GSM-R, WI-FI
- storage of load profile at least 60 days,
- meter accuracy class as 1 or better.

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TEMS – Train Energy Management System

CENELEC STANDARDISATION

FUTURE WORK

- On the Next Plenary Meeting (June 2007) in Erlangen TC9X will:
 - Confirm WG11
 - Issue a Call for Expert to enlarge the WG11 membership
 - Give the task to WG11 to prepare new parts of the EN50463 that shall cover:
 - the format of the data transmission from on-board to ground,
 - the architecture and structure for energy measurement on fixed installations and the billing rules.
 - WG11 shall receive the Report of the RailEnergy Group as an Input document
- the new parts are expected to be ready for the end of 2008.
- According to ERA, energy measurement and billing shall be an IC (interoperability Constituent)

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TEMS – Train Energy Management System

CENELEC STANDARDISATION – FUTURE WORK
Interoperability Issues – Possible roles of INFRASTRUCTURE Companies

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TEMS – Train Energy Management System

CENELEC STANDARDISATION – FUTURE WORK
Interoperability Issues – INFRASTRUCTURE Company as an ENERGY SUPPLIER and DISTRIBUTOR

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CENELEC STANDARDISATION – FUTURE WORK
Interoperability Issues – INFRASTRUCTURE Company as an ENERGY DISTRIBUTOR

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TEMS – Train Energy Management System

CENELEC STANDARDISATION – FUTURE WORK
Interoperability Issues – System Structure, Areas Concept

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TEMS – Train Energy Management System

CENELEC STANDARDISATION – FUTURE WORK
Interoperability Issues – Hot topics to be solved

- European structure for the transmission of measurement data and global system organization
- Validation process and responsibility of measurement data between players
- Billing structure definition
- Way of data access for infrastructure partners
- Determination of energy losses on the catenary
- Alternative settlement for energy billing in case of meter failure
- Regulation, legal and gauging problems implicated by different national laws
- European regulation about metering on board trains for standardized agreement between infrastructure companies and carrier companies would be right

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TEMS – Train Energy Management System

ENERGY SAVING CONCEPT

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ENERGY SAVING RESEARCH IN EUROPE

Examples (among the others)

- **The project CATO, Computer Aided Train Operation,**
Project started by Transrail in 1998 and financed by the Swedish National Rail Administration and the train operator MTAB.
- **The DB pilot project ESF (Energiesparende Fahrweise)**
Started in 2000 in cooperation with the university of Hannover. Interactive time table adjustment with the goal to have an energy saving between 5 and 10 % .
- **MAECO, Marcia Economica, TRENITALIA pilot project**
Research project started in 2003 in Italy. The aim is to install energy metering on board of locomotives and to instruct the driver for the optimal speed driving. The results coming from the first trial on 4 locomotives indicates an average energy saving around 10 to 15 %.

**Standardisation activity in Europe.
Towards a fully compatible vehicle and onboard energy management system**

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THANK YOU FOR YOUR ATTENTION