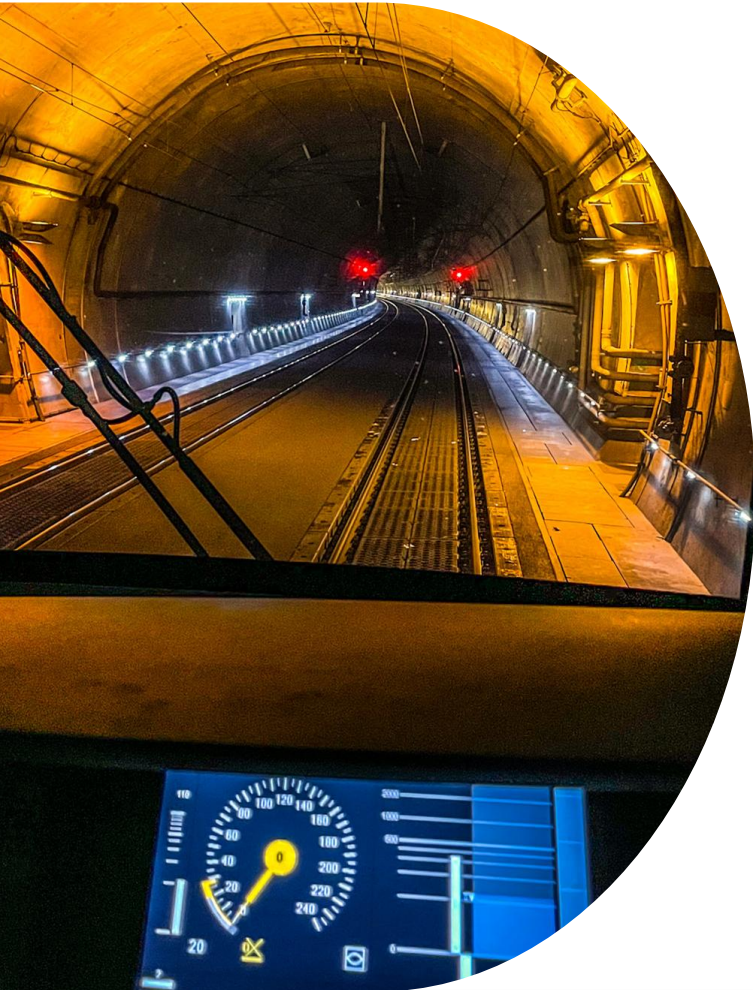


ETCS Operational Experience – Drivers' Perspective



ETF - European Transport Workers Federation

ALE - Federation of European Train Drivers' Unions



ETCS operational feedback



TRAINING



OPERATIONAL
CONSTRAINTS



COLLECTIVE
FEEDBACK



Why Driver Education & Simulator Training are Critical for ETCS Success

Why simulator training is essential

- Safe environment for rare & critical scenarios
- Training of non technical skills:
 - Decision making, stress handling
- Increased workload in degraded situations:
 - Repetition builds automaticity and confidence
- Cross border differences



ETCS-Drivers Performance Principle

ETCS is not only a technical system – it is a human-machine interface.

Safe and efficient operation depends on well-trained drivers and most desirable Human-Machine interaction.



ETCS operational feedback PROS

Extreme reliability

“Full” awareness of driving tasks to be performed in advance and during speed reductions, EOA approaches.

Spad Risk is effectively reduced. It’s not the main risk to assess by drivers during the journey.

Reduced stress, driving trains is consistently more comfortable.

ATO in cruising mode is a powerful tool to assist drivers.



ETCS operational feedback CONS

Progressive loss of skills in driving tasks, for example: “*When drivers return to a class B environment, they feel more stressed.*”

**Decrease in transparency and situation awareness.
Combined observation to recovery all the values expected.**

Degraded modes are a source of stress for the driver as it is mainly experienced in a simulation environment.



ETCS key challenges – a driver's view

Key DMI challenges

- Contrast & Brightness issues
- Limited viewing angles (depends on used hardware)
- Non-uniform sound info (different system versions)
- Lack of full harmonisation between suppliers

Speed Area & Planning Area

- Limited anticipation in short Movement Authorities
- Dynamic BL3 curves perceived counterintuitive
- Planning area readability concerns (BL 3.6, speed restrictions)



ETCS key challenges – a driver's view

Operational & Technical Issues

- Complexity in degraded modes
- GSM-R disconnections & unstable RBC handover
- Odometry inaccuracies
- Overlay ERTMS trackside implementation
- Freight operations affected by BC low performances

Human Factors – Trust Conflict

- Lack of balance in cognitive workload
- Decreased situational awareness
 - For example SPAD events caused by poor visual perception of the physical lineside signal (EoA)



ETCS operational feedback

Driver's general feedback

- Space for improvement in the DMI interface:
 - Essential information for the driver that should be displayed by technical means in DMI.
- Simulation training acquires more importance as it should be performed with more periodicity.
- ATO development should take into account HOF at any delivering stage.



ETCS key challenges – a driver's view

Cross Border Operations

- Harmonisation is key
 - Unified rules in cross border operations
 - Patchy deployment along whole corridors
 - Different national ETCS implementations
 - National rules still sit on top of ETCS



Summary

ETCS = Human–Machine System

- ➔ Safe and efficient operation depends on well-trained drivers, high complexity and strong human factors impact
- ➔ Key points are DMI usability, braking curves
- ➔ Training in real time and simulators = essential
- ➔ Unified rules will be key in future

