

## ERTMS FROM THE DRIVERS' POINT OF VIEW

### HOW ERTMS FACILITATES TRAIN OPERATIONS FOR DRIVERS

During a train journey, drivers have to reconcile two objectives which may somehow seem opposed: maintaining complete safety whilst ensuring full operational performance and respecting timetables. By providing a specific cab signalling display, ERTMS helps drivers in their day-to-day operations. Thanks to the feature of continuous speed supervision, the driver receives full data about the maximum speed profile according to the track topology at each time.

#### *What does ERTMS change from the driver's point of view?*

ERTMS affects the job of the drivers in four different ways:

- By providing full cab signalling;
- By monitoring all operational modes (full supervision, shunting, on sight, reversing, splitting....) while any legacy system can monitor only some nominal modes. ERTMS therefore provides an enriched data entry process for the driver as compared to legacy systems;
- By strongly reducing the risk for human errors, as emergency brakes are automatically applied if a driver misinterprets a signal.
- By providing him with more time to observe the track ahead.



#### *The planning area: which benefit for the drivers?*

The "planning area" (the track is identified visually on the drivers' desk) provides a powerful tool for the driver to improve the operation of the train, as he receives key information on the status of the tracks several kilometres ahead:

- Static characteristics, such as temporary speed restrictions, speed profiles, singular points like level crossings, bridges and tunnels, neutral sections, etc.
- Dynamic characteristics, such as speed restrictions subsequent to an occupied track: this allows the driver to anticipate braking and acceleration phases, and is of particular importance for freight trains in order to improve energy consumption and limit the efforts on the coupling.

Globally, ERTMS therefore provides all the necessary data for the driver, even with a reduced knowledge of the line. In the longer term, this may reduce the training burden of the Railways Undertakings.



### Shall the driver still observe the lineside signals?

A key issue in the case of signalling-related accidents is due to the problem drivers may face to identify and interpret the lineside signals – for example because of the adverse weather conditions.

As an Automatic Train Protection (ATP) system, ERTMS will automatically apply the emergency braking system if a driver fails to interpret signals and speed limitations in a correct manner.

Besides this, in-cab information significantly helps drivers in their operations:

- With ERTMS level 1, lineside signals are still used for initiating the moves;
- However, with ERTMS level 2, lineside signals are no longer required;
- In-cab information for ERTMS is defined in order not to contradict lineside signals information where they are retained.
- In any case, national operational rules determine whether the driver still has to look at the lineside signals.

### Will ERTMS allow for a reduction of Drivers' Machine Interfaces?

Yes - the multiple signalling system currently implemented in Europe make a drivers' cab particularly complex (see picture below), especially in locomotives designed for long-distance freight. In the long term, as an increasing number of railway lines will be equipped with ERTMS, the ERTMS cab display will gradually replace the other ATP systems onboard the train. This will facilitate operations, increase traffic safety and reduce implementation and maintenance costs of signalling equipment.



Example of a driver's cab in an international locomotive, where multiple legacy systems are used

### Can legacy systems be integrated into the Driver-Machine Interface?

Yes - Legacy systems can be integrated within ERTMS thanks to the use of a Specific Transmission Module (STM) device. In such cases, the legacy system indications (if and where maintained) can be integrated on the same Driver Machine Interface (DMI) as far as the driver is concerned. Information from the legacy system is provided to the driver in a similar way as ERTMS. In addition, the data entry procedure is shared, as far as possible, between ERTMS and the legacy system to avoid the multiple entries and therefore potential error introduction by the driver.

## SUPPLIERS

ALSTOM

 AnsaldoSTS

 PRAHA

BOMBARDIER

CAF

 mermec group

SIEMENS

THALES