ERTMS IN CONTROL CENTRES
HOW CAN ERTMS LEVEL 2 AND 3 FACILITATE TRAINS TRAFFIC MANAGEMENT FOR CONTROL CENTRE OPERATORS

Everywhere in Europe, Control Centre Operators have to ensure the full performance of day-to-day train operations to respect timetables and make sure trains and passengers arrive on time. This includes taking efficient decisions in case of perturbation, and offering mitigation measures. By minimising the operational constraints due to signalling and making additional functions and relevant data available to Control Centre, ERTMS helps the traffic controllers in their day to day operation.

What are the operational constraints of legacy signalling systems?

Control centre operators are usually limited by legacy signalling systems in their possibilities to ensure a full and timely control of the trains on their network:

– Emergency stops are only possible at fixed locations where the signals are located;

– Boundaries Temporary Speed Restrictions are in accordance with existing Block Section and usually wider than the area to be protected;

– Track conditions definition ("Neutral section" zone, "Axle load", "Air Conditioning", "No stop location"…) are also limited to fixed locations and upfront announced time periods;

– The removal of a route already dedicated to a train takes time due to the fact that the route is blocked during a period of time to guarantee that the corresponding train is actually stopped.

How does ERTMS improve this situation?

The European Train Control System (ETCS) is in permanent contact with the trains and knows precisely and permanently their position, their speed and their braking distance. This allows controlling the trains with the highest flexibility and efficiency:

– Immediate emergency stops everywhere and at any time;

– Temporary Speed Restrictions applied exactly on the portion of track which must be protected without disturbing the rest of the track;

– Track condition selectable everywhere in real time;

– Cooperative Movement Authority (MA) revocation and MA reduction permit operator to resume the itineraries quicker than a conventional systems having long latency periods.

In addition, the operator remains in permanent direct contact with the drivers by sending operational messages (operation information) via text messages (in the case of ETCS) or voice communication call (GSM-R voice).

How can ERTMS improve the global supervision of train operations?

ERTMS Levels 2 and 3 provide train position reports with additional train information like actual train speed, location, mode of operation (trip, system failure …) and unique identity. Others types of Information (like train data, odometry problems, etc…) may be provided to the control centre and to the remote maintenance system.

The speed and status information is displayed to the operators in order to quickly identify trains operating in specific modes (non-nominal modes). The position report is worthwhile to anticipate traffic management and support the operators' decision.
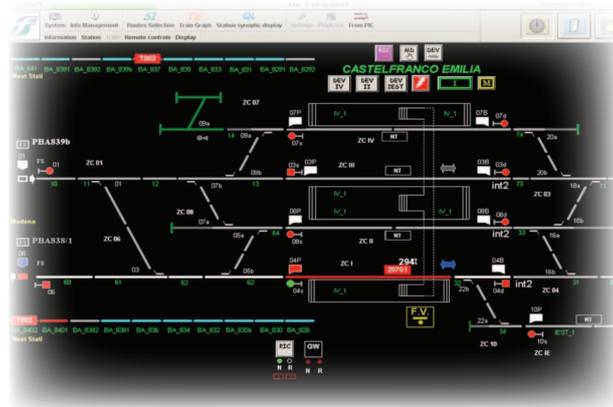
The train describer uses directly train identities instead of making references to pre-defined tables and specific algorithms for initialization follow-up and reset. This allows to know exactly which train is where whatever the situation, including highly degraded situations.

This interoperable dialogue with trains through the exchange of various standard information (regardless from train type and characteristics) allows for an improvement of train operations. It also eliminates the voice medium to transmit orders or advices - which is an issue for internationally driven trains.

How can ERTMS further enhance the reliability of train operations?

The use of train information provided by ETCS Levels 2 and 3 allows to perform and/or improve various useful functionalities like "consistency check" between planning and real situation (verification of "Train Running Number ID", Train category, train length/convoy type, train characteristics), to trace conditional route/itinerary and thereby to anticipate and manage potential conflicts in a faster and efficient way.

These reports of the actual situation with accuracy allow for the allocation of incident root cause, so that train operators and infrastructure managers can agree on possible penalties in case of a delay.

Want to know more about ERTMS? Please check **www.ertms.net** or contact UNIFE at ertms@unife.org