

Presentation the Smart Freight Train by Rob van Looveren

This text is the annex to the Smart Freight Train presentation given at the IRFC 2017 in Prague.

1. The Smart Freight Train, a new subsystem for the European railway system

The development of telematics applications for the railway system has a long history:

- With the Directive 2001/16 the EC has decided that telematics application should become subsystems of the European railway system. This resulted in the development of ERTMS and TAF/TAP.
- With the consecutive Railway Packages the EC indicated that there is still a strong need for innovations for the rail goods transport. The CEF Transport and Shift²Rail programs are setup for that purpose.

What is “digitization”?

Telematics applications can be seen as a part of “digitization” which in general points at the development of information systems.

The interest for “digitization” shows that the rail market is ready for these innovations. This is the reason why I made the design of the Smart Freight Train (SFT) and have setup the SFT project. And I am happy to present it to you.

2. The concept of the Smart Freight Train system

What is the essence of the “Smart Freight Train” system and how does it work?

The information need of the various stakeholders is characterized by three questions.

- Where is my train?
- What is the status of my train?
- What is the condition of my wagons?

The SFT system is fully focused on the operational process of freight train operations. The SFT system will provide the real time information of the freight train operations process to the related processes for the rail goods transport.

The concept of the SFT system is the combination of an on-board system and an online trackside system. The SFT mobile control unit is the link between the SFT on-board system and the SFT trackside application. The train driver will use the SFT control unit for communication with the SFT system.

The SFT on-board system will perform the continuous condition monitoring of the wagons and the monitoring of the train consist. The Train Integrity Monitoring (TIM) will be part of that monitoring function.

Freight Train operations is a complex operations with many parties at trackside who contribute to the Freight Train operations process, but they also have the need to receive information to run their own operations. The SFT online application will fill in the role of a “message broker”. This concerns the real time information of specific freight train movements. That information will be provided to stakeholders in a customized way. They will be able to follow in real time the progress of the freight train and to get informed about events which occur.

3. Freight Train operations

Freight Trains provide the physical transport of goods for the rail modality. For Logistics Operations (full supply chain) the physical transport of goods is an essential process. The main goal is to deliver goods as planned and agreed. This means that a constant monitoring of “where are my goods?” and “can the goods still be delivered in time?” is necessary to be able to act in case the transport process deviates from the original plan.

For the transport by truck at the longer distances we see that the high ways are getting overcrowded. For the railway branch this is a perfect opportunity to take over a large portion of this goods transport.

What is the role of the Smart Freight Train? The main goal is to provide real time information to the various stakeholders who are involved. The specific goals of the SFT system are differentiated per stakeholder. The first stakeholders is the train driver on-board the freight train. The other stakeholders are at trackside.

I think with the SFT system we can make a difference for the rail goods transport. And this fits in the European policy as well.

4. The right information at the right time for the right person

The freight train operations process is directly or indirectly related to other processes. The various processes are performed by the various roles. On the slide the context is given. The Freight Train Operator is set in the centre. The roles in the circle around contribute to the Freight Train operations and vice versa.

The main operational processes for freight trains are:

1. Plan the rail goods transport (train path + time schedule)
2. Prepare the freight train movement (train documents, train crew)
3. Move the freight train (“Freight Train operations” process)

The roles and their tasks related to freight train operations are:

- Task of Logistics Operator (LO)
 - Get transport orders (consignment note - Clients)
 - Demand transport means (wagons – Wagon Keeper)
 - Issue train order to Railway Undertaking (train order – RU)
- Task Railway Undertaking (RU)
 - Plan freight train services (request train paths – Infra Manager)
 - Prepare the train movements (train documents, traction units, train crew plan)
- Task Train Driver
 - Make train ready (train documents, brake test, ready for departure – Traffic Control)
 - Move freight train (movement authority – Traffic Control)
 - Safe movement of freight train
 - Handover freight train (wagon list – station/yard manager)
- Task Infra Manager (IM)
 - Provide rail capacity (train path, time schedule)
- Task Traffic Control
 - Manage safe movements of trains (movement authorities – train driver)
- Task of Wagon Keeper (WK)

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- Provide wagons
- Task Entity in Charge of Maintenance (ECM)
 - Maintenance of wagons
- Task of Station / Yard Manager (wagon list)
 - Reception of freight trains
 - Marshalling wagons
 - Breakup and makeup of trains
- Task of Emergency Services (dangerous goods - 112)
 - Secure environment of an accident (Police)
 - Fight the fire (Fire brigade)
 - Transport of wounded people (Ambulance)

Specific information need

It will be clear that all these stakeholders are in need of the right information at the right time. Every role will demand specific information which fits in their operational process and business. The main task of the SFT system is to provide that information.

5. Telematics subsystems of the European railway system

The context of the subsystems for the European railway system concerning the telematics applications is given on this slide.

The SFT system will be positioned as a complementary subsystem to the ETCS and TAF TSI applications. The SFT system has the following relations with the subsystems ERTMS and TAF TSI.

The SFT online application will get an interface with

- The Path Coordination System (PCS) of TAF TSI for exchanging information concerning the requested train path.
- The Train Information System (TIS) of TAF TSI for providing real time information about the freight trains.

The SFT on-board system will get an interface with

- The ETCS on-board system for providing train integrity information.

6. The Smart Freight Train project

The SFT Associate Partners & OLTIS-Group have setup the SFT project plan. The plan is to start the project on 1 November 2017. You are all invited to participate in the SFT project and discover the benefits for your own business.

Send an e-mail to Rob van Looveren and you will receive information about how to join the SFT project.

I hope you will help us to make the SFT system successful. Thank you for your attention.

7. Thank you for your attention

You can visit the website www.vanlooverenconsultancy.com.

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