



Project “East West Transport Corridor II” (EWTC II) WP 4 – Business Opportunities in Railway Transport Task 4A – EWTC Joint Railway Concept

REPORT on Legacy Information Systems and Identification of Related Interfaces

Vilnius, 20-09-2010
Revised 30-09-2011

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Note: *The report contains information as target data for development of the task 4A -EWTC Joint Railway Concept and for contribution to the task 3C– Information Broker System in the early stage of the EWTC II project.*

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1. Summary

Legacy IT systems for management of freight transportation, which demonstrate a wide range of systems used in in the Eastern part of the EWTC corridor, are listed in the report.

It is a wide range of IT systems for freight transportation management by rail used in the eastern part of the corridor EWTC, i.e. 1520 mm gauge railway system.

JSC “Lithuanian railways” Freight Transportation Directorate uses four main IT programs for management of freight transportation:

VPS - This information system is dedicated for wagons transfer between the border stations.

OPKIS - This is an operative computer information system for freight transportation, which allows exchanging the information between Cargo Stations in Lithuania.

IS “KROVINYS” - This information system is dedicated to collect all main freight transportation documentation into one central database.

STOKIS – This is a system for station information and its purpose is to manage movement of wagons in the station.

All these IT systems are closely integrated between themselves and data exchange is carried out in real time automatically.

Russian Railways is using the latest information technology to ensure its systems provide of the best service for freight customers, including trains monitoring and cargo registering automatically.

DISCON - In December 2001, a second priority for the automated container traffic control system (DISCON) was devised and put into operation on the Russian railways.

DISPARK - The DISPARK System is a comprehensive program which allows highly accurate estimation of fleet operations.

ETRAN - the third system currently being put into operation organizes cargo traffic on the Russian railways using an electronic transport ‘invoice’ called ETRAN.

"Palma"-The "Palma" (Palm) System allows the automated reading of vehicle registration numbers, whether locomotives, cargo and passenger cars or high-capacity containers, and their registration when passing across checkpoints.

SIRIUS - a network-integrated Russian information-management system operates in real time and analyses, forecasts and decides traffic organization, management of car and locomotive fleet, and the loading and unloading of cargo.

Interoperability between railway service providers is based on information exchanges with help of general messaging system for the countries OSJD, so called ASOUP.

2. Background to the project

Volume of trade between Europe and Asia is increasing constantly. Naturally there is a need to create sustainable transport corridor from Southern Baltic sea region to Belarus, Russia, Central Asian countries, China, also to Ukraine and the Black Sea region. The concept of a green corridor favored for sustainable water and rail transport modes for cargo transportation, for ITS solutions for road transport, for effective interaction in transport hubs and co-modal terminals, for modern information exchange technologies among all stakeholders throughout the corridor.

The railway network has been created according country's strategic needs of each country, under their existing legal norms, standards and so on. Therefore a huge diversity of railway systems and rail freight business models was formed in EWTC. Rail transport is used for various IT systems that are incompatible especially in the western and eastern parts of the corridor.

3. Aim of the task

Creating the EWTC joint railway concept is to offer solutions to enable improvement in quality and competitiveness of railway services and smooth movement of cargo via rail. The railways network in each country was created according country's strategic needs, of their existing legal norms, standards and so on. There is a huge diversity of railway models in EWTC and variety of information systems used to manage cargo shipments. The country-oriented approach is still very strong in the railway business, particularly in the Eastern EWTC. Therefore, to design EWTC Joint Rail Concept, select the corridor management model and harmonize interfaces between various IT systems is quite complex.

Legacy IT systems of Eastern part of EWTC presented in the report.

4. Methodological presumptions

The East-West transport corridor includes EU and non EU countries in the transport infrastructure (road, railway, and fairway), hubs (ports, logistics terminals), transport equipment and machinery, IT and communications systems, operating and administrative procedures. On viewpoint of methodology of management for an effective network services, at the same time seeking to reduce the negative impact of transport on the environment and social costs, it is important to ensure optimal use of all elements of the transport corridor network in isolation and harmonious interaction with each other. It means the necessity to improve performance of each element of logistics chain and integrate interaction of all elements that the EW transport corridor to function as a coherent system.

Therefore, it is a special emphasis on "soft Infrastructure" development, including the processes of information integration of the freight corridor in EU transport policy. For railway mode of transport one of basic EU decision for integration IT systems is to implement traffic management system for rail ERTMS.

In July 2009, the European Commission adopted the European ERTMS Deployment Plan that provides strong guarantees for freight operators wish to equip their locomotives with ERTMS:

- the plan foresees the equipment of more than 10,000 km of railway lines by 2015 and 25,000 km by 2020; this deployment is mandatory (part of EU Law);
- these lines consist of 6 full ERTMS corridors (i.e. the busiest cross-border freight routes in Europe) and a list of designated freight lines;
- these requirements will also be applied to freight locomotives (trains ordered after 2012 or put in service after 2015 will necessarily have to be equipped with ERTMS);

In parallel, an increasing number of European countries have planned to go beyond their obligations defined by the European ERTMS Deployment Plan and equip their entire network. This is the case of Denmark and Switzerland.

EWTC corridor is specific, because the Danish and Swedish railway network has no direct connection with the Lithuanian railway network. Therefore, the report identified the IT systems which are used for the 1520 mm gauge railway network, in particular Lithuania and Russia.

5. Legacy information systems and identification of related interfaces

Here is a brief information about the use of IT systems for freight transportation management in Lithuania and Russia - the Eastern part of the corridor EWTC, i.e. 1520 mm gauge railway system. It is lack of information on use legacy IT systems in Belorussian railways.

5.1. Legacy IT systems for freight transportation management in Lithuanian railways

JSC “Lithuanian railways” Freight transportation directorate uses four main IT programs for freight transportation management:

- **VPS** - This information system is dedicated for wagons transfer between the border stations;
- **OPKIS** - This is an operative computer information system for freight transportation, which allows exchanging the information between the Cargo Stations in Lithuania;
- **IS “KROVINYS”** - This information system is dedicated to collect all main freight transportation documentation into one central database.
- **STOKIS** – This station information system and its purpose is to manage wagons movement in the station.

All these IT systems are closely integrated between themselves and data exchange carried out in real time automatically.

The data of these systems in the future will be main data source for Telematic Application for Freight Technical Specifications Interoperability (TAF TSI) and maybe Information Broker.

A more precise and more complete information on legacy IT was provided to consultant Pia Larson of SWECO's on 14th September 2010. Further information update IT issues will be on implementation of the task 3C. JSC “Lithuanian railways” is partner of the task 3C.

5.2. Legacy IT systems for freight transportation management of Russian railways

Russian Railways is using the latest information technology to ensure its systems provide the best service for its freight customers, including monitoring of trains and registering of cargo automatically.

DISPARK - The DISPARK System is a comprehensive program which allows a highly accurate estimation of fleet operations. A completely automated tracking and cargo traffic quality-control system, DISPARK monitors the state of carriages used on trains and trains that inadvertently veer off-course. DISPARK includes detailed information about each car and the 100+ operations that it can carry out. The system operates in real time and covers the whole Russian railway network, which is divided into 849 sections with 4,000 technical and cargo stations, 20,000 house tracks and 174 car repair shops.

DISCON - In December 2001, the second priority control system (DISCON) for the automated container traffic was devised and put into operation in the Russian railways. This unique system uses a database holding information about each container with its number. The main aim of the system is to improve container traffic efficiency and maintain control over the tracks the trains take, monitoring their state of repair and how accurately the cars comply with each operation.

ETRAN - The third system currently being put into operation organizes cargo traffic in the Russian railways using an electronic transport 'invoice' called ETRAN. This railway information system will work together with the information systems used in other modes of transport, including dock-side stations and ports. These multipurpose technologies are based on powerful and highly reliable digital communication channels that control all 17 regional divisions of Russian Railways. The linkup between these technologies will allow the commercial and performance procedures of cargo traffic to take place through electronic data exchange.

"Palma"-The "Palma" (Palm) System allows the automated reading of vehicle registration numbers, whether locomotives, cargo and passenger cars or high-capacity containers, and their registration passed across checkpoints. Automated identification using "PALMA" completely dispenses with the need to record the registration numbers manually and ensures the efficient and reliable exchange of vehicle information. In the near future, "PALMA" will be used in all automated control systems connected with traffic processes.

SIRIUS-In summer 2004, the scientific and technical council of Russian Railways approved the introduction of the SIRIUS system into the Russian railway structure. This network-integrated Russian information-management system operates in real time and analyses, forecasts and decides traffic organization, car and locomotive fleet management, and the loading and unloading of cargo. SIRIUS calculates technical details on the basis of a previously devised 'master plan' and regulates the operation of each traffic application, including import and transit across Russia.

5.3. Interfaces

The data exchange between Lithuanian Railways, Belarus Railways and Kaliningrad Railways (Russian Federation) are carried out operatively through automated information systems. This is made with help of general messaging system between the countries OSJD called ASOUP. With these messages there is an exchange of consignment note data, train list data, time of the border crossing, and so on. ASOUP system provides the data of consignment note without an electronic signature.

6. Conclusions

It is a wide range of IT systems for freight transportation management by rail used in the eastern part of the corridor EWTC, i.e. 1520 mm gauge railway system.

JSC "Lithuanian railways" Freight transportation directorate uses four main IT programs for freight transportation management:

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