Improving European Railways

retrack

An Integrated EU-Project

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EDITORIAL

Gerwin Zomer, TNO

After a tough period with some delay to the project plan, we are now accelerating at a rapid pace. To let RETRACK benefit from this late spurt, the project will be extended in duration until July 2012. That also gives us the opportunity to initiate some challenging research activities. One of them includes the extension opportunities of the RETRACK corridor in an Eastern direction, linking RETRACK to the EURASIA corridor. A second one is the development of a knowledge instrument for corridor development, which we will develop in a generic way and apply to the RETRACK corridor: the RETRACK Knowledge Base. More details can be read in this newsletter.

In RETRACK, the demonstration is becoming more stable and mature, bottlenecks and growing pains have been resolved and the frequency of service has doubled. The training and simulation tools, particularly the ERSA traffic simulator help us to understand better the impacts of ERTMS level 2 on the operation and helps us to formulate proactive mitigation strategies for deviations from planning. SOPTIM, RETRACK's IT partner has developed the IT solutions and is making them compliant to the current TAF-TSI standards.

As you can see, RETRACK is running fast. In 21 hours from Hungary to Cologne the RETRACK train is as fast as an intercity train. The success of RETRACK is to combine this high speed with quality and flexibility, thus realising not only the requirements of its customers but also contributing to a sustainable European economy.

Report on the RETRACK train

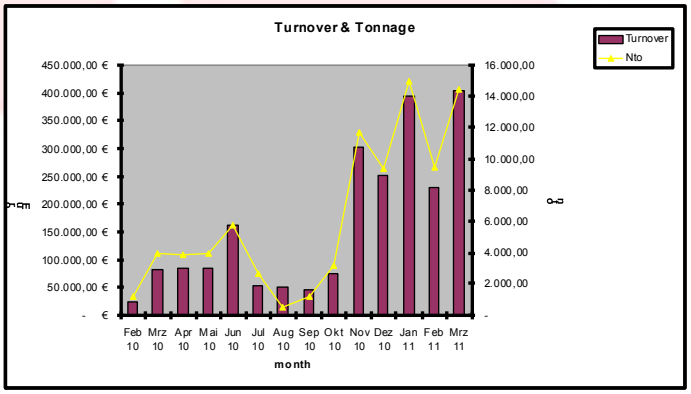
Johannes Marg, Transpetrol

Between February 2010 and the end of March 2011, a total of 144 trains have run between Cologne and Györ or vice versa. A total of 91,400 net tons of various commodities have been transported, translating into 1760 loaded and 1520 empty railcars. A wide range of commodities have been transported: Corn and soya in bulk and containers, liquid dangerous goods, polyethylene and white wine in containers, automotive parts such as engines, and miscellaneous spare parts, vegetable oil, aluminium slabs and increasingly various chemical products in bulk. The latter includes sulphur-dioxide, ethylenoxide, ethanol, LPG and others.

The RETRACK-System developed from one weekly block train focused on the particular needs and demands of one or two customers to a steadily running, hub-based service with three departures per direction a week focused onto wagon groups and single wagon, thus establishing the only such international system in Europe operated exclusively by private operators.

The RETRACK-Demonstrator went through various phases during its development, both negative and positive ones.

In sheer numbers, the development of the Demonstrator looks as follows:



Start-up phase Feb 10 to June 10

WHAT IS RETRACK?

The RETRACK project is applying an innovative rail freight service concept to the movement of rail freight across Europe. RETRACK is the "Reorganisation of Transport networks by advanced Rail freight Concepts". It is funded under the European Commission (EC) FP6 Programme. The project started in May 2007.

In the Start-up phase, 30 trains were run, averaging 5.000 t/90 loaded wagons per month for a total of three customers. Cost coverage was not satisfying, as were key performance indicators, mainly due to shortcomings of communication between involved railways and organizational shortcomings on the operators side. However, first successes in customer acquisition were realized.

Stagnation phase due to wagon fleet defect (July 10 to Oct 10)

In July 2010, an extraordinary accumulation of serious defects of the employed fleet of grain wagons, which to this point provided the bulk of the train capacity, led to the necessary retirement of the entire fleet. This step became necessary to avoid the possibility of serious incidents during rail transport, mainly due to extensive axle problems. Thus in this time only 17 trains were run, averaging 1.750 t per month/50 loaded railcars per month for two customers. The main customer kept faith, however, and promised to continue transports with RETRACK as soon as the technical problems were solved. Sales activities continued, but on a very low profile.

Re-Start-Phase with two weekly roundtrips (November to December 2010)

After a revision and replacement of 130 out of 165 defective grain hoppers, the RETRACK-System "re-booted" with two regular roundtrips per week + additional trains. Additional customers (container & chemicals) joined RETRACK, the total of 6 regular customers, averaging 12.125 t/250 loaded wagons per month in 39 trains during that period. During November 2010, the System was running quite smoothly, yielding a considerable boost in both operative and commercial performance indicators.

December 2010 began very promising with orders allowing for 6 weekly trains, justifying the change from an externally sourced railway operator for the German part of the traction to a new Transpetrol-owned operator. However, the change of operator unearthed a number of organizational shortcomings in both rail operation and train operating. These problems were multiplied by dramatic weather conditions in combination with the inability of the network provider to de-ice the frozen switches and the fire in the Dutch shunting station Kijfhoek, all of which led to the enclosure of up to 4 RETRACK-trainsets for about a week. All this led to extreme delays and decreased commercial performance due to loss of income and additional operational costs.

"Balanced System" - Phase with three weekly round-trips (January to March 2011)

Following a recovery period in January, the RETRACK Sytem stabilized both in terms of rail operation and train operating, allowing for 58 trains in this period, averaging with 13.330 t in 253 loaded wagons per month, transported for up to 10 customers. The RETRACK main line locomotive(s) - provided by LTE - is now the operational responsibility of TransPetrol. The hub in Cologne is now fully operational as such with shunting unit, local team and sufficient rail infrastructure for train consolidation, while the Hungarian hub is being developed. Through the implementation of new staff for train operating, a fixed roundtrip-schedule, the hub operation in Cologne and new IT-based tools the level of operational control was increased considerably, resulting in very smooth operations. The share of single wagons and wagon groups in the trains did gain considerably, establishing RETRACK as a true wagongroup-system.

The System is now (April 2011) running like clockwork and is increasingly attracting interest with new clients. Train capacity is increasingly utilized to the full in terms of train length and/or tonnage. However, further necessary improvements need to be effected both in operational and organizational issues before a further considerable increase in train capacity of the System is intended.

RETRACK Knowledge Base

Min Zhang, TNO

Work Package 12 RETRACK Knowledge Base started in January 2011 and it is expected to run until the summer 2012. This work package primarily concerns the design of a knowledge base with regard to the rail oriented freight sector in the European Union, and the application of it on the RETRACK corridor.

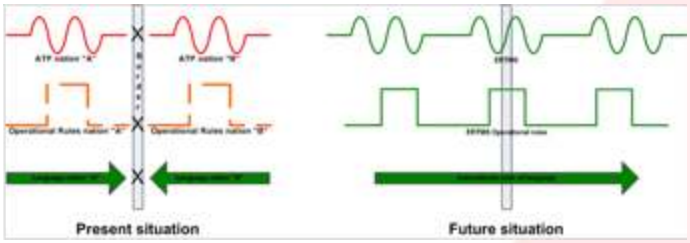
This knowledge base is intended to build for both policymakers and market operators. It covers a broad spectrum of topics at different levels, including traffic and infrastructure, market conditions, existing services, and legislation and governance. In this knowledge base data and information are presented in thematic maps or in document forms, but also they are assessed and transformed into knowledge, as high-level inputs for decision-making for different stakeholders. Furthermore, instead of the traditional, country-based approach, the knowledge base takes up a corridor approach, where all data and knowledge are geared to a particular rail freight corridor -the RETRACK corridor. Supported by this corridor approach and given the generic nature of the technical design, the knowledge base allows itself to be applicable in the long run also for other corridor developments. For example in the EU, the nine priority routes defined in the EC regulation European Rail Network for Competitive Freight. This shall contribute to, among others, the realisation of EC objectives with regard to the revitalisation of the railway sector and co-modality policy in general.

Training the Drivers

Cees van der Moolen, DeltaRail

Work Package 5 on training will concentrate on staff requirements in the actual cross border train operations to enable a comparative analysis between present and future conditions: the impact of ERTMS/ETCS Level 2 to improve technical interoperability and the introduction of a "code of language" to remove language barriers. The philosophy behind the use of a code of language is based on the use of numbered and alpha numerical coded fixed operational safety messages that can be exchanged between train and traffic control.

Different training blocks with reference situations (normal conditions) and degraded situations shape the framework for the training. New operations concepts based on future situations are included in separate blocks.
More generally, the question the training can answer is: What is the influence of the new concepts (Code of language, ERTMS Level 2 and the RMS system) on the removal of barriers on cross border train runs? By applying simulation and by training staff for the situation where ERTMS Level 2 will be available for the entire RETRACK Pilot Railway network the impact of ERTMS Level 2 and a code of language can be applied and the results analysed and compared with the present conditions.
Simulation software and hardware will be used to support the training and to combine and test all of the above mentioned goals to be able to measure the effect of the new concepts.



The ERSA Traffic Simulator (TRAFFIC-SIMU) is the platform for controlling all trains on the specific tracks of the RETRACK service corridor. The ERSA Operational Simulator (OP-SIMU) train simulator is the platform for driving the RETRACK train.
All RETRACK train movements and a representative portion of regular traffic surrounding the RETRACK trains will be simulated using the ERSA Traffic- simulator (TRAFFIC-SIMU). In the training, the role of TC will be carried out by DeltaRail, as leader of the simulation and training. For the operational RMS training the RETRACK trains can be run in automatic mode with no real train drivers necessary or in manual mode with the RETRACK train drivers operating simulated trains using the ERSA OP-SIMU.

The OP-SIMU will be used as a stand alone system not connected to the TRAFFIC-SIMU for the training of ERTMS/ETCS.

The OP-SIMU can be optionally connected with a 3D renderer application.

Example of ERSA Operational Simulator (OP-SIMU) + 3D extension

For the training of a code of language and the simulation of the future situation (ERTMS/ETCS + a code of language) a number of OP-SIMU's will be connected with the TRAFFIC-SIMU for manual operational control of the RETRACK trains.

RETRACK and TAF TSI - The European standard for electronic information exchange in rail freight traffic

Markus Brozio, SOPTIM AG

Management of freight trains requires considerable information exchange between the partners involved. The partners include: the responsible railway undertaking (RU), national infrastructure managers (IM) and possibly further railway undertakings. They exchange information like wagon lists and departure times but also path orderings. The communication itself is often based on emails, phone or fax. The disadvantages of this procedure are obvious: a high amount of manual effort and the sensitivity for errors, e.g. during the transfer of wagon numbers, are only two examples.

That problem was recognized by the EC more than ten years ago. With the directive EC/16/2001 "Railway interoperability" the framework for TAF TSI was created. TSI stands for "Technical speci-fications for interoperability" and TAF for "Telematic applications for freight service". The TAF regulation of 2006 is only one of several TSIs. Until 2013 TAF TSI has to be implemented and then it will be mandatory.

TAF TSI describes the electronic messages interchange for rail freight traffic. The contents and technical details are written down on several hundred pages. The messages themselves are en-crypted and sent via the internet in a special format to registered and known partners only.

The TAF TSI messages are used for handling well defined business processes, especially

- Ordering of train paths
- Issuing orders for moving wagons and freight
- Sending information about planned and actual arrival times

- Sending information about unplanned events like delays and wagon breakdowns

An essential part of the TAF TSI standard is the definition of so called roles, which can be adopted by the involved organisations. As well as the infrastructure manager (IM) there are the railway un-dertakings (RU) and one leading railway undertaking (LRU). The LRU is responsible for the cus-tomer contact, the path ordering and the transfer of the resulting wagon transport information to the RUs. When a train is completely managed and executed by only one railway undertaking the LRU and the RU are identical.

The TAF TSI usage implies the existence of several IT-systems. The railway undertakings and the infrastructure managers need software systems having a TAF TSI compliant interface. In addition a central management system, the so called "central repository" is required. That system holds beside other functions a "phone book" for the secure message routing and some data encryption mechanisms. Finally as a part of the TAF TSI framework there are several centralized wagon da-tabases. There users can find not only the technical data of every freight wagon but also its current position.

Today the development of the central repository and the definition of the detailed technical specifi-cations are the responsibility of the UIC and its "common components special group". The group consists of about 50 undertakings from the railway business. Financed by the members themselves and the EU, they have commissioned a Swedish software company to develop the central technical components of the TAF TSI framework. It is planned to finalize the work by the end of 2011 - with a one year delay compared to the original planning.

Especially for small and medium (private) railway undertakings TAF TSI is a particular challenge. They first of all require railway-specific IT-systems which support the new standard. And it is also expected that they have to adopt their business processes.

Besides the fact that not all of the specifications are finally agreed and the central components are not yet available, it is possible to implement the first organizational and technical steps for the TAF TSI standard now. In RETRACK we are currently running a feasibility study about how and to which extent we can use TAF TSI for the RETRACK train and the information exchange required. The results are planned to be implemented with the RETRACK ICT-solution.

Further reading:
UIC TAF TSI website:
http://www.uic.org/spip.php?Rubrique882

Extension of the Corridor to Russia and China

Igor Davydenko, TNO

Three alternative corridors linking the RETRACK corridor to Russia and China:

Recent trade development has led to a vision towards land-based transport services between Europe, Central Asia, and the far east. Given this and followed by the launch of the pilot service in 2010, RETRACK gives a broader continental perspective by aiming now at the possible connection of existing West-East European corridor onward to Russia and China.

RETRACK intends to explore the potentials for corridor extension to Russia and China through three alternative Eurasian rail routes:

- RETRACK corridor - Trans Siberian corridor - Western China
- RETRACK corridor - Kazakhstan - Western China
- RETRACK corridor - TRACECA - Western China

Along these three routes feasibility studies will be conducted, which include assessing rail freight policy priorities and market developments in Russia and China, probing potentials of linking the three Eurasia land-bridges to the RETRACK corridor, and investigating the feasibility of setting up rail freight services towards Russia and China, as well as the preparation of demonstrations.

New RETRACK Brochures available

Three new RETRACK brochures are available to download. One is the updated RETRACK brochure describing the project. The other two, one in Russian and one in English describe the vision for extending the RETRACK corridor to Russia and China. A translation into Chinese will be available shortly. Go to http://www.retrack.eu/site/en/documenten.php to download copies.

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