SBB CFF FFS

ETCS: Key success factors

Introduction

Swiss Federal Railways belongs to the early adopters of the new European ERTMS/ETCS-Standard. After large initial system challenges (teething problems) in the pilot project Zofingen-Sempach (35km double track, 63 locomotives) the overall suitability for commercial operation could be proven already in the year 2002.

By end of 2006 ETCS Level 2 will be commissioned on the new line Mattstetten-Rothrist together with a fleet of approx. 450 locomotives. This represents the largest ETCS investment in Europe so far. From the view of commercial operation and quality expectations (242 trains per day , headway of 2 minutes@200km/h)) and all participants (operators, industry, infrastructure) this ERTMS project is probably the most complex one.

By end of 2007 Switzerland will have done the major investments for a network wide use of ETCS - a fleet of 553 locomotives and trainsets will be equipped with ETCS (currently more than 400 locomotives are already fully equipped). Total investments in ETCS by end of 2007: will add up to 400 Mio. €.

From SBB point of view, based on vast experiences made in the last seven ERTMS years, the following key success factors are considered as crucial:

1. ETCS System Maturity and Evolution

The actual ETCS standard (SRS 2.3.0) does not yet fully cover the functional aspects for future crossborder high speed and freight traffic operation. The required system functionality and its related products for the intended rollout on the TEN corridors will only be achieved with the system version SRS 3.0.0.

The final suitability and performance of this new technology will only be proven with the commissioning and daily operation of ERTMS in a large scale application (combination of a large number of different vehicles in a tight and interlinked high density mixed traffic schedule). In Switzerland this will be achieved by going into operation on the new line between Mattstetten and Rothrist by end of 2006. Right now there is no equivalent application in operation, which can prove the system reliability and availability.

The completion and consolidation of the ERMTS/ETCS standard and the necessary further product rework and development shall be managed by the new European Rail Agency. The related costs of the system and product development and certification shall be carried by the European Union in the frame of the TEN contracts.

It is a key factor for the investment protection, that new SRS versions (ie 3.0.0 and 4.0.0) will be fully downward compatible to the currently used versions SRS 2.2.2 and SRS 2.3.0.

2. Market Prices of ETCS Products

Price evolution of the past five years shows evidence that the promises of the industry could not be kept in any way. This may also (but not only) be explained by increasing system complexity (driven by requests of the railway companies), large delays against the ERTMS master plan and the enormously high expenditures for the system development and homologation in the different countries.

Market price situation onboard equipment (ETCS Eurocab for Level 2):

	Average costs Swiss Market, set costs (k€)	Price indication Industry, set costs (k€)	Cost-Factor
New rolling stock	640	127.5	5
Prefitted rolling stock	1’160	135	8.6

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Refitting RS where space is available	280 *	217.5	1.3
Refitting RS where space is to be found	310 *	324.5	0.95

* market price was not set when contract awarded to industry

Especially for small fleet application (which is typical for ETCS retrofit activities) the one time costs of the industry and operators are the key cost driver. Such one time costs are in the average of 3 -10 Mio € per rolling stock type.

Only if we succeed in bringing the market prices close the target price indication above, ETCS will be accepted as a future alternative to the well established Cab Signaling systems. In addition substantial efforts are necessary on the part of the Ministries of Transport (cross acceptance of notified body certification), on railway undertaking side (harmonisation of requirements and of operational rules) and by the industry. The current market prices prevents an economically sound rollout.

3. Financing concept

A comprehensive financing concept has to be defined for the migration period, so that for involved operators no discrimination results in their market position during the transition phase (capital costs due to investments and production costs).
The migration towards ETCS is economically not possible for the railway operators without any substantial or full funding of the onboard equipment. The co-financing should be large for early adopters, because they take all investment risks with small or no economic benefit. The incentives are to be reduced for late comers (or been omitted completely).

4. ERTMS Migration

A clear priority shall be set and thus focusing on the TEN corridor north/south (Rotterdam Genova) must take place, since on this corridor some important ETCS projects are close to commissioning (Betuwe-Line, HSL Zuid, Loetschberg-Basel Tunnel) and the mid term advantages for cargo operators seem obvious. The experiences from this corridor application are then to be transferred to further TEN corridors from the Van Miert report.

5. System-Upgrades

Every effort has to be made, that after the implementation of SRS 3.0.0 and its application on the corridor Rotterdam Genova, no further mandatory system changes and adjustments will be necessary anymore. The SRS 3.0.0 therefore shall be the final approved and legal specification within the directives 96/48/EG and 2001/16/EG (TSI).
Any further baseline specification SRS 4.0.0 shall contain only optional functional extensions, with no legal obligation to upgrade existing lines and / or rolling stock.

6. ERTMS Program Management

In the ERTMS history, roles and responsibilities were never clearly defined between the involved parties. A professional program management shall be established by the representatives of the European railways *(UIC, CER, new committee with Chairman K. Vinck; to be discussed)* ensuring an overall management and tracking of all activities.

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