

team supports ÖBB

Successful introduction of ETCS level 2 as system integrator



Railways must be able to pass freely along all trans-European routes in order to offer an ecological and economic alternative to road haulage and air transport within the EU. For this to happen, railway operators need to implement the European Train Control System (ETCS) and Austria is playing a pioneering role in this process. By the end of 2012, the ÖBB (Austrian Federal Railways) had implemented ETCS Level 2 on 160 km of new and upgraded lines along key routes. A critical element of this success was the optimal management of interactions between ÖBB departments, subcontractors, industry partners, consultants, the authorities and others. The implementation of ETCS Level 2 was treated as a cross-company programme and required an expert system integrator: team. team is a daughter company of Frequentis that specialises in project management and technology consulting. team's experience and expertise proved vital in keeping this highly-complex system integration task on plan.

A project for pioneers

A tight schedule, non-negotiable completion date and the coordination of three global corporations and their subcontractors made for a highly complex system integration task. Austria took a leading role in the European Rail Traffic Management System right from the start. "We implemented ETCS Level 1 back in 1999 on the Vienna – Hegyeshalom line, so we had some relevant experience. But GSM-R-based ETCS Level 2 was still a whole new ballgame for us. It impacted

Client profil

ÖBB (Austrian Federal Railways) is Austria's largest mobility service provider and its trains are the most punctual in the EU. Its rail network covers some 4,894 km and carries around 224 million passengers each year. ÖBB is one of Europe's top 3 rail freight operators, transporting around 100 million net tonnes of freight.

Business situation

Within the trans-European rail network, rail operators must implement the ETCS train protection system together with GSM-R wireless communication when building new lines or modifying existing ones. The aim is to ensure smoother cross-border train operation in the EU. In 2006, ÖBB decided on a 2021 deadline for implementing ETCS level 2 on 885 km of new and existing track. The first 218 km had to be finished in time for the timetable change on 9 December 2012.

Solution

As the system integrator, team supported ÖBB throughout the project in order to safeguard the functionality of the entire system. This support covered highly complex project planning and management tasks, testing, certification and documentation. As independent experts, team managed the cross-system dialogue between the project's industry partners.

Impact

ÖBB demonstrated that ETCS Level 2 can be implemented cost-effectively on existing lines and on routes used by a variety of train types.

"Trust comes from keeping your promises. With team, it didn't take long for all those involved to say 'this works for us'."

Peter Kleinschuster, ÖBB Infrastruktur AG

the whole organisation, from infrastructure through to training. That's why we knew from the start that we'd need expert support for the initial implementations – somebody who could coordinate all the required tasks", recalls ÖBB Infrastruktur AG's Peter Kleinschuster, who is responsible for the introduction of ETCS Level 2. and his team clearly saw busy nights ahead of them, "The move of the GSC could only occur between 22:00 and 4:00. We had to use this short timeframe as intensively as possible, and this required exact planning. At 4:01, all locations had to have maximal redundancy again."

team in the team

ETCS had to become integrated into standard operations. In order to do so, ÖBB set up a programme team to allow knowledge generated through the project to spread immediately throughout the organisation. Participants included line staff and (from 2009) project experts from team in the role of independent system integrator. The aim was to ensure subsystem interoperability and the level of safety required by the TSI (Technical Specification for Interoperability). The line equipment from Thales, Alstom Transport's train systems and Kapsch CarrierCom's GSM-R network all needed to work together seamlessly. Additionally, new procedures had to be integrated into ÖBB's existing organisation and workflow in order to obtain official certification from the Austrian authorities

before operations could begin. Standard procedures were not designed to tackle these challenges. The first was to define new processes for tasks involving testing and evaluation, regulations and standards, and programme management. A "BigPicture" tool was developed specifically to leverage transparent planning and control activities.

Dialogue as the key to success

For Wolfgang Hammerschmidt, team's managing director, it was important to distinguish between the many different interests of project participants, but to do so through an objective and constructive dialogue where the strategic importance of the end goal had priority. "It's only possible to play the role of referee when dealing with crosssystem interfaces if you don't let every tiny problem escalate into something big. You need to be able to discuss issues as equals and in a constructive, objective way, then provide expert evaluations of the proposed solutions". Given the fixed deadline, Peter Kleinschuster valued team's ability to recognise and prioritise decisions to be taken to keep the project on track. "The official certification process, for example, involved various timeframes that we had no influence over. Our colleagues in team made it very clear how we needed to deal with this and what had to be done, when and by whom, in order to ensure we could still keep to the cost and time schedule", notes Kleinschuster.

Key facts

Project start: 30 April 2008

team begins work as system integrator: March 2010

Project completion: 9 December 2012

System integration for three lines: Kufstein – Brenner line 108km (new and existing track), Kundl – Baumkirchen line 40km (new) and the Vienna – St. Pölten line 70km (also new)
Train radio communications – Kapsch CarrierCom: GSM-R
Line equipment – Thales: Two radio block centres and some 3,100 balises

On-board equipment – Alstom Transport: 452 vehicles from ÖBB Series 1016/1116 (Taurus fleet), 8090 (Railjet driving trailer), 1216, ICE-T, IH vehicles

Programme content: Proof of interoperability and TSI conformity; proof of GSM-R QoS for ETCS; adaptation of

regulations and standards; training of dispatchers, drivers, IH personnel; approval (by the authorities) of lines and vehicles for ETCS operation in Austria

Tests and evaluation: Definition of processes; laboratory and field tests; test criteria and specifications; test efficiency (synergies); test coordination; test coverage; test documentation; evaluation/analysis; problem solving

Rules and standards: ETCS operational scenarios; ETCS capabilities; ETCS planning criteria; ETCS parameter setting; braking curves; transition to STMs; border crossing

Programme management: "BigPicture" tool; progress control; risk management; task monitoring; certification and approval processes; change management; integrated documentation; configuration management

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