



FITSCO Meets Critical Quality, Timeline Goals for Automated Train Signaling Solution with Wind River

Chinese Transportation Company Passes Stringent Safety Certification Goals with Wind River VxWorks Cert Platform and Wind River Professional Services

FITSCO

Industry

Transportation, rail

Solutions

- Wind River VxWorks Cert Platform
- Wind River Professional Services

Benefits

- Reduced development time and costs
- Reduced project risks
- Passed stringent SIL4 safety certification in reduced timeframe and within budget



Shanghai Fuxin Intelligent Transportation Solution Co., Ltd. (FITSCO) is an intelligent transportation technology company located in Shanghai, China, that specializes in metro and tram signaling and communication systems solutions. A spinoff of the well-known Alcatel-Lucent Shanghai Bell Co., Ltd., FITSCO has completed large metro projects in Beijing, Shanghai, Guangzhou, Wuhan, and many other cities in China. The company also contributed to the 2008 Beijing Olympic Games and the 2010 Shanghai World Expo's metro operations and maintenance.

The Challenge

FITSCO began the Auto Train Protection (ATP) system project research and evaluation in 2008. The key project challenge was to pass the SIL4 assessment, which required an EN 50128– certified operating system, on schedule and on budget.

FITSCO's JeRail® Automatic Train Operation (ATO) signaling system is a communication-based train control system that supports bi-direction operation for metro and light rail. The ATP system is the core of the ATO signaling system, responsible for the train's critical operations, including speed, orientation, integrity protection, and door interlocking. Each of these functions has specific safety and security requirements, and is designed with dual backup.

"The JeRail ATP-100 is a milestone product, developed using considerable FITSCO intellectual property (IP) and strict adherence to international standards during our R&D, system design, and manufacturing processes," says Hao Wu, general manager, FITSCO. "The control system has a modular design and needs the capability to be upgraded and expanded independently. All of these requirements are critical to enable our solution to compete with those from global leaders such as Siemens and Thales."

The Approach

To meet this challenge, FITSCO evaluated several software vendors. After researching their backgrounds, capabilities, project timeframes, costs, and professional skills, the company selected Wind River®. With more than 30 years of safety-critical software experience, Wind River was the only vendor that could provide a comprehensive trusted systems platform. Wind River VxWorks® Cert Platform was combined with Wind River Professional Services to enable FITSCO's critical project goal of passing SIL4 on time and on budget.

The VxWorks Cert Platform provides FITSCO developers with a commercial off-the-shelf (COTS) platform for delivering applications that must be certified to the stringent international requirements of EN 50128. EN 50128 deals with the functional safety of electrical/electronic/programmable electronic safety-related systems and other related software standards. "With VxWorks Cert Platform, our developers can take full advantage of technological advances in microprocessors that the VxWorks COTS real-time operating system (RTOS) enables," Wu says. "The result is a strong OS foundation that meets the most demanding safety certification standards."

"We chose VxWorks Cert Platform as the foundation for our automated train signaling solution to enable real-time requirements in a safety-critical environment. We trusted the Wind River solution."

— Hao Wu
General Manager, FITSCO

Wind River Professional Services enabled a seamless integration of the VxWorks Cert Platform safety case—the documented demonstration that the product complies with the specified safety requirements—into the ATP Controller. Specifically, Wind River Professional Services

supported the specification and implementation of fault detection mechanisms under challenging safety and performance requirements, as well as the development of software interfaces to particular hardware peripherals using wellproven processes and tools.

"Wind River is the ideal partner for us because they provide a holistic safety development approach. Wind River VxWorks Cert Platform with TÜV certificate and VxWorks Cert Platform Safety Manual, combined with Professional Services, ensured that our project development stayed within our timeframe and cost targets. We successfully passed SIL4 safety-certification."

— Hao Wu,
General Manager, FITSCO

The Result

"Achieving certification required meticulous planning and rigor in following the mandatory processes," Wu says. "Wind River helped us keep the project running smoothly and enabled us to quickly pass the audit by the international certification organization TÜV and conform with the stringent SIL4 safety integrity standard."

Another benefit to FITSCO was the Wind River partnership with Freescale. The ATP-100 project used the Freescale MPC8360, and because of the strong collaboration between Freescale and Wind River, the hardware easily passed the SIL4 safety certification.

The entire project took approximately two years to finish and the product received SIL4 certification in November 2012.

"With Wind River, we shortened our time-to-market by three months," Wu says. "This equals a 12.5% improvement in our total project time."

Summary and Future Plans

“Wind River is the ideal partner for us because they provide a holistic safety development approach. Wind River VxWorks Cert Platform with TÜV certificate and VxWorks Cert Platform Safety Manual, combined with Professional Services, ensured that our project development stayed within our timeframe and cost targets,” Wu concludes.

“We successfully passed SIL4 safety certification.”

As a result, FITSCO plans to continue working with Wind River for its next-generation ATP product development.

