Certified Success: LSIS Speeds Delivery of Smart Train Control System With Wind River

Solution Helps LSIS Obtain Korea's First SIL4 Certification for Train Control Systems

LSIS Co., Ltd. is a leading specialist in electric power and automation solutions throughout Korean and subsidiaries around the world. In 2011, the company became engaged in a national project to develop the Korean Radio-based Train Control System (KRTCS), for the unmanned remote control of trains via Long-Term Evolution (LTE) wireless communication as well as Wi-Fi.

THE CHALLENGE

An overriding goal of the KRTCS project was to achieve the Safety Integrity Level 4 (SIL4) certification, the highest safety grade in the rail sector, which would mark the first such certification for Communications-Based Train Control (CBTC) in the country. The key issue was that the entire project, including development of standard features, onsite testing, demonstration, and certification, had to be completed within three and a half years.

"That was barely enough time for the certification process alone," recalls project leader Yonggee Cho. "Moreover, conducting the certification process for the board support package (BSP) on our own would have exceeded our budget and capacity."

In order to deliver a certifiable solution, LSIS needed a development partner with extensive experience in similar challenges to help minimize risks and satisfy the project requirements.

THE SOLUTION

LSIS evaluated a number of potential providers. The search eventually came down to two candidates. While one of them offered a lower price, it could not provide the long-term technical roadmap LSIS required. Wind River®, on the other hand, could not only provide the roadmap but also demonstrated a long track record of successful software implementations in the rail and communications industry. LSIS, meanwhile, had a history of success using Wind River solutions in other parts of its business. "We felt we could trust Wind River based on its size,

LSIS Co., Ltd.

Industry

Transportation, Rail

Solutions

- Wind River VxWorks Cert Platform
- Wind River Cert Network Stack
- Wind River Professional Services

Results

- Delivered advanced train control solution within a three-and-a-half-year time constraint
- Accelerated certification process and earned Korea's first SIL4 certification for CBTC wayside and onboard systems
- Completed project within budget

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>
> —Yonggee Cho, Project Leader, LSIS

support, and long-term stability," Cho says. "And it was the only partner that could holistically deliver on our core requirements, namely the operating system, board support package, and certification. We concluded that no one else could meet these criteria."

Obtaining SIL4 certification required a commercial off-the-shelf (COTS) platform for delivering applications that have to meet the international railway software standard IEC 62279. LSIS used Wind River VxWorks® Cert Platform, a real-time operating system designed specifically for safety-critical applications that must meet rigorous certification standards, along with the Cert Network Stack, which is certified for CBTC. In addition, Wind River Professional Services assisted in the development of a certifiable BSP.

To meet the rigid safety requirements, Wind River provided support for the entire certification process in the development of BSPs, as well as a safety manager to successfully deploy advanced processes for the entire development lifecycle, including plan, design, test, prototype development, verification, and validation.

"The Professional Services team was a big help, especially during the difficult times when the development schedule changed in the middle of the project," Cho says. "Wind River understood the position we were in and had the agility to keep the process moving forward. It helped that there was a local project manager to actively communicate with the client and accelerate the development process."

THE RESULT: THE FIRST KOREAN SIL4-CERTIFIED CBTC SYSTEM

The KRTCS system is designed for the remote control of train departures, stops, and track assignments, as well as the intervals between trains. Using the Wind River platform, LSIS successfully developed both an on-board system for the automatic control of speeds and intervals and for the delivery of train status information to a total traffic control center, and a wayside system that receives the operation status information and controls train operations.

"The core Wind River solution and support from Professional Services enabled LSIS to achieve Korea's first SIL4 certification for CBTC on-board and wayside systems," Cho reports. "We concluded it would have been difficult to get the certification if we tried to develop the BSP on our own, or if we worked with a partner other than Wind River. Only Wind River had the expertise to systematically manage the entire process, from development to certification, as well as get evidence for the results to minimize testing and validation risks."

Cho credits the combination of Wind River technology and expertise for delivering the project on time and within budget. "In particular, VxWorks made obtaining certification possible. It was simply indispensable. Successful implementation of VxWorks, development of the BSP through Professional Services, and systematic management of the certification process are the three factors that led to the success of this project."

THE FUTURE

The successful delivery of KRTCS has opened up a world of opportunities for LSIS in the global rail market. "This was a very important project to demonstrate our technological power and expand our business," Cho says. "LSIS brought the 'smart train' to Korea and introduced the first CBTC system in the world that uses both Wi-Fi and LTE technologies. We expect that this will not only become a new standard in local railway projects, but that it will become a bridge that leads to expansion into the global market and the creation of new business opportunities."

Wherever that bridge leads, Wind River will likely be a part of the company's plans. "We have a long-standing relationship with Wind River going back many years," Cho says, "and we expect to collaborate with Wind River in the future."

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