

TCT, Chengdu Metro Line 3

Taking a Safe Train Ride Home

Riding on Chengdu Metro Line 3, you can reach various historic sites that are more than one thousand years old. The metro line's mission is to provide convenience for sightseeing and mitigate urban traffic issues. Apart from providing optimized transportation to Chengdu's residents and visitors, Chengdu Metro Line 3 also drives the market expansion of TCT's independently developed communications-based train control (CBTC) technology.

CBTC Becomes the Mainstream Technology

Traffic Control Technology (TCT) is the first and the only high-tech company in China that has independently developed the CBTC signaling system technology. Until recently, all TCT's projects had been limited to Beijing. Now, Chengdu Metro Line 3 has become the first metro line outside Beijing to have adopted TCT's CBTC technology. For TCT, this is big milestone as their domestic CBTC technology enjoys wider national attention.

For passengers, the shift from a traditional control system to CBTC means shorter departure intervals between trains. With the traditional system, only one train at a time could enter a tunnel between stations, but now several trains can run at the same time in a tunnel with a safe distance between them. In terms of the huge traffic congestion, shorter departure intervals significantly increase the transport capacity of metro lines. Gao Chunhai, Chairman of TCT, stresses: "The CBTC system is a milestone in rail transit development. With metros taking the lead in adopting the CBTC system, I believe in the future, high-speed trains, freight trains, and other trains will also apply this system." CBTC is a communications-based train control system, which combines signal control with communication.

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Gao Chunhai
Chairman, TCT



Traffic Control Technology

Founded: 2009

Headquarters: Beijing, China

Industry: Rail transit

Employees: 397

Website: www.bj-tct.com

Results

- Higher signaling system reliability and optimized operation stability
- Dual redundancy to improve system operation stability
- On-time project delivery and lower TOC
- Rapid operation and maintenance support

Extending Global Reach

With proven experience in Beijing's Metro Line 7, Changping Line, Yizhuang Line, and other projects, TCT has become the leading provider of CBTC signaling systems for Beijing Metro, illustrating that this independently developed technology can compete with similar technologies of international giants. But it is worth noting that the success of TCT was only limited to Beijing, and TCT had seldom undertaken any projects in other places. Chengdu Metro Line 3 provided a valuable breakthrough for TCT.

While Chengdu Metro Lines 1 and 2 adopted the wireless CBTC signaling systems and equipment of UniTTEC and Ansaldo respectively, Chengdu Metro Line 3 decided to adopt the domestically developed CBTC signaling system provided by TCT. How did TCT seize the opportunity to convince Chengdu Metro to adopt its solution? Huang Chao, the project manager of Chengdu Metro Line 3 said: "TCT has mastered the localized core system technology with independent intellectual property rights. We offer economical prices, instant after-sales, and maintenance services, and these are the advantages we have over foreign vendors." However, given the fact that it is the first time that Chengdu Metro has adopted China's independently developed CBTC, Huang Chao admitted that Chengdu Metro did hesitate at the time. "After all, it is the first project of TCT outside Beijing."

Challenges

It is the first rail transit project of TCT outside Beijing. TCT needed to convince Chengdu Metro that the stability and usability of its CBTC system would contribute to more cost-effective solutions.

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Huang Chao

Project Manager of Chengdu Metro Line 3, TCT

Breaking Boundaries Through Collaboration

TCT began by addressing two major concerns of Chengdu Metro: progress of construction and operational quality. In terms of the progress of construction, TCT, through project management and execution, strictly controlled the progress of each phase and informed Chengdu Metro of the project's progress in a timely manner. With regard to operational quality, TCT invited Chengdu Metro to Beijing to inspect Beijing Metro Line 7, Yizhuang Line, Changping Line, and other projects on site and witness the stability and usability of TCT's CBTC systems and equipment, thus eliminating their doubts.

TCT and Moxa have been partners for years. Moxa's network communication solutions have been widely used in rail transit automation systems around the world. "Moxa is trustworthy," Gao said, "In fact, TCT was cooperating with a US vendor at first. Its products were mainly used in the general-purpose communication field instead of the rail transit field at the time. Therefore, many problems or failures encountered could not be solved."

On the contrary, Moxa quickly helped TCT solve these problems, backed by its experience and expertise in rail transit. For the Chengdu Metro Line 3 project, Moxa developed separate components for TCT as required to reduce the packet loss rate of wireless communication and realize dual redundancy, thus ensuring operational stability. Huang Chao further explained, "The Ethernet switch and wireless solutions of Moxa realized real redundancy for both ATC's red and blue network and ATS's dual network. The failure of one network will not affect the operation of equipment, thus ensuring operational stability."

"Moxa has provided strong technical guarantees for Chengdu Metro Line 3. At the beginning of the project, the site was in poor condition. Moxa sent professional technicians to provide debugging guidance and training on the spot, and assisted us in building the network. Before the official opening, we encountered some problems in the debugging. Moxa immediately sent technicians again, who stayed on the site for several days to perform packet capture analyses in order to solve the problem before operation began."

Moxa Partner

Beijing CASEEN

Moxa Solutions

- Customized wireless product to reduce wireless communication packet loss
- Managed switches for dual redundancy to improve system operation stability



An Unwavering Winning Streak

Since its introduction at the end of 2016, Chengdu Metro Line 3 has safely operated for more than 700 days and has come out in front in Chengdu's metro line network for its low signaling system failure rate and high operational reliability. The system with its "Chengdu configuration" is tailor-made for the operational needs and living habits of Chengdu's residents. TCT and Moxa's partnership has won the recognition of Chengdu Metro with its outstanding performance.

Besides Chengdu Metro Line 3 Phase II and III, TCT, together with Moxa, has also won the bids on signaling systems for Chengdu Metro Lines 5 and 8, as well as metro lines of Chongqing and Guiyang. Compared with foreign CBTC vendors, TCT offers a more stable technology with a lower equipment failure rate and achieves the timely repair of equipment.

Gao particularly emphasized the concept of "building a community with a shared future." Gao said, "Moxa is great. They deliver excellent Ethernet switches, network transmission, and wireless products and services, and communicates well with us. Unlike other industries, the metro cannot afford to stop operation. This is also the reason why TCT will continue working closely with Moxa."

Currently, TCT and Moxa have expanded their cooperation from products and technologies to an all-around level. Every year, they pay visits to each other to maintain a close partnership. Whether on national level, enterprise level, or project level, building a "community with a shared future" is bound to be the direction of the partnership between TCT and Moxa.

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Gao Chunhai
Chairman, TCT