SmartMeasures

Tough projects call for smart measures.

AmbergRail

Railway Maintenance and Upgrade from 160km/h to 200km/h
汉丹铁路
Hankou-Danjiangkou, China

Project

- Hankou-Danjiangkou railway maintenance project
  长白铁路扩能改造
- Improve the tracks from 160km/h to 200km/h

Duration

- September to November 2018

Contractor

Wuhan Railway Bureau
武汉铁路局
www.whrailway.cn

Tasks

- Measure and evaluate the track geometry
- Automatic calculation of optimized solution for horizontal and vertical track alignment
- Optimization of horizontal and vertical track alignment

Challenges

- Lack of control point network next to track
- Short time window for work of 2 h/day
- Neighbouring lines in operation

More speed for Hankou-Danjiangkou railway

Hankou-Danjiangkou railway was constructed in 1958~1966, and put into operation in 1967, with a total length of 412km. In early times, the operation speed was at quite low level, such as 60km/h, and after several expansions and renovations, the operation speed came up to 160km/h before this upgrade project.

In order to improve track quality and increase speed up to 200km/h, the owner created an absolute control point network beside the track. But over the years the quality of the control point network decreased and finally became unusable.

Simple high performance data acquisition

Considering the special track situation without control points and absolute design data, Amberg Technologies' local distribution partner Bonanza Rail Technology

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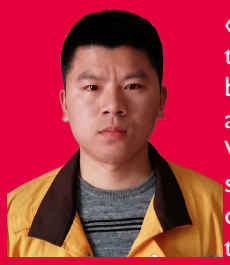

«With IMS 1000, track survey becomes so easy and so efficient. We would never switch back to our outdated traditional survey work with different instruments and manual calculations. We are convinced by it's high performance and we think that IMS 1000 is the best choice for track measurement in Handan railway.»

Gang Zhou 周刚
Surveying Engineer
Wuhan railway Bureau

Amberg Technologies' products used

- Amberg IMS 1000 system
- Amberg Rail 3.0 software with Relative Survey and Track Optimization module

Customer benefits

- Optimal for upgrade old railway without absolute track design
- No need of control points. Higher reliability and efficiency compared to traditional methodes
- One run for short and long versine
- Sophisticated and easy to use software

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recommended an IMS 1000 system and relative survey module to Wuhan Railway Bureau.

With high performance IMU technology, the measurement system delivers a continuous survey of the inner rail geometry. The relative survey module can record track geometry without measuring control points. Optional stops to adjust the odometer can furthermore improve the data quality and reliability. The lightweight trolley can be pushed by one operator and the software workflow is easy to use.

Comprehensive data evaluation

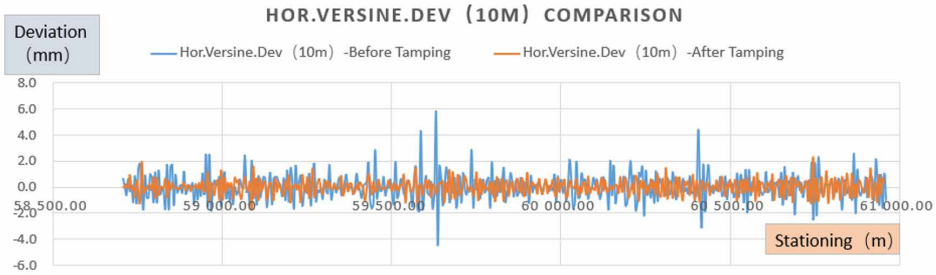
The collected data can be processed by an Amberg Rail 3.0 tamping application. The basic principle of relative track survey is to eliminate versine deviations of both horizontal and vertical alignment to improve the smoothness of the track, which is a key criterion for passenger comfort on a moving train.

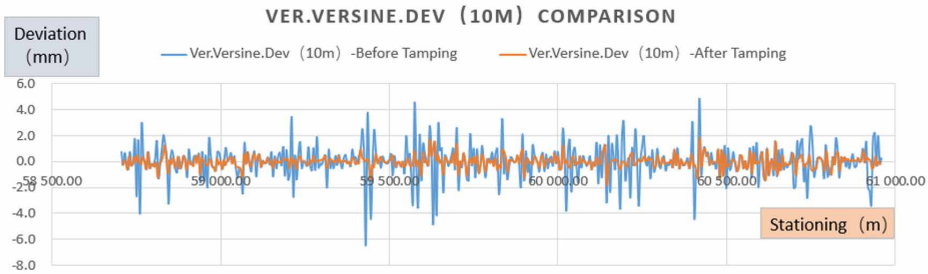
Thanks to the highly accurate IMU, the inner geometry of the track can be evaluated very efficiently. Amberg Rail 3.0 tamping application provides flexible settings such as user defined chord length. Typically used chord lengths in this project are 10m, 70m and 120m. After customized parameters are confirmed, the software can output the horizontal/vertical versine deviations automatically.

Based on the versine deviations, an optimized alignment with simulated result will be suggested. Project related parameters, such as tamping machine adjustment range, can be defined. After confirmation of the result, the correction value of the track can be calculated automatically and output for the tamping machine.

Results

After one measurement and one tamping run, the track condition has been significantly improved. The graphics below show the comparison between the horizontal and vertical versine deviations for a chord length of 10m before and after tamping. The deviations are now within the limits.





Conclusion

The Amberg IMS 1000 system is easy to use, highly accurate and very efficient. It can be used independently of neither absolute track design nor control point. After the measurement, an impressive improvement of TQI (Track Quality Index). was observed. The system helps the customer save manpower as well as material resources.

Made in Switzerland

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