



Huang Cheng, manager of the Shanghai Water Environment Investment Company.

## Shanghai: Bus Terminals record data for the “Zhao Jia Bang” waste water system

→ The densely populated “Xu Jia Hui” district in the south-west of Shanghai is a flourishing business quarter. The speed of the economic development and intense construction activities meant that the old waste water system could no longer cope with demand and a fundamental reconstruction was required. In the current second development phase of the project, the new pumping station “Zhao Jia Bang” should be connected to Shanghai’s central sewage treatment monitoring and control system. Beckhoff Bus Terminals are used for data acquisition at the sensor/actuator level.

The local control system for the sewage pumping station is connected with the higher-level central control system. The process parameters for monitoring and control of the subsidiary pumping stations that have to be transferred to the central system include the flow rate of the sewage pump and the operating state of the pump systems and the mechanical equipment. Furthermore, the requirements of Shanghai Drainage Ltd. and of the Shanghai control center for the prevention of flooding have to be taken into account. The rainwater pump levels, precipitation quantities and operating conditions of the pump and sluice system for “Zhao Jia Bang” have to be transferred to the Shanghai drainage information system in good time.

The new pump system is designed both for rainwater and for sewage. The associated pumping stations are consolidated to form a single system. The control system consists of two relatively independent units. They are connected via a common interface located in the control station, which is responsible for automatic checks and overall control of the system.

All field I/O points are connected with the central control system via DeviceNet and a total of 38 distributed Beckhoff Bus Terminal stations.

In order to optimize the price/performance ratio, Bus Couplers of type “Compact” (BK5220) and “Low Cost” (BK5200) are used.

### All devices on a single bus

Huang Cheng, manager of the Shanghai Water Environment Investment Company, explains the control architecture: “Using conventional technology, measured data are transferred via many signal cables directly to the central control station, where they are processed by a PLC.” “Due to the increasing integration of automation and communication technology, fieldbus technology is becoming more and more significant.” Huang Cheng refers to the new pumping station for “Zhao Jia Bang”, as an example for the application of the new technology. The system exclusively uses Bus Terminals for data acquisition at the device level. This results in significant savings in terms of cabling costs and design effort.

Following a system analysis, the institute dealing with development tasks for this project (Scudri – Shanghai Urban Construction Design and Research Institute) de-

cidated to use DeviceNet for connecting the PLC with the field devices. The traditional components of the drainage system (such as valves, ventilation systems, deodorizing systems and drives) are connected with the central control station via DeviceNet, making point-to-point-connections unnecessary. The number of cables between devices could thus be reduced significantly, leading to higher system reliability.

“We are very satisfied with the Beckhoff Bus Terminals. The openness of the bus modules and the flexible I/O combination options offer significant benefits,” said Zhang Qi, project manager of Shanghai Fenqiang Automation Equipment Co., Ltd., who supplied the control system. “The benefits of the Beckhoff Bus Terminal system, which supports practically any fieldbus, were very convincing: The I/O modules offer 1, 2, 4 or 8 channels in any combination. For these reasons, our recommendation to the institute responsible for the development and to our customer (Shanghai Water Environment Construction Ltd.) was to use the Bus Terminal system from Beckhoff. The decision to go for the Beckhoff system turned out to be the right and indeed a wise decision.”

### CX1000 is the first choice

Given the wide range of application options for Beckhoff products, Huang Cheng is optimistic about further co-operation with Beckhoff: “This project gave us insight in the system philosophy behind Beckhoff products. The Embedded PC CX1000 is also of interest to us. The CX1000 products also have open interfaces and comply with the international IEC 61131-3 programming standard.

The use of fanless, non-rotating PC components and the embedded operating system are the basis for the outstanding stability and reliability of the CX1000.

In our experience, the software PLC not only offers the complete functionality of a conventional PLC, but can also deal with far higher data quantities than a conventional solution,” Huang Cheng continued. “In future, in addition to the Bus Terminals we will install further products from Beckhoff in order to optimize our waste water treatment system. The CX1000 is the first choice for the new control, monitoring and waste water information system of the city,” said Huang Cheng.