

Wonderware Products Help Water Commission for China's Yellow River Reduce Engineering Time, Cost and Effort

"I believe that with the expansion of this system, we can make the Yellow River more beautiful and younger, and bring more benefit to Chinese people along the Yellow River."

Liu Xiaoyan
Director of the Water Regulation Bureau

Zhengzhou, China — Like the Nile in Egypt or the Tigris and Euphrates rivers in Mesopotamia, for 6,000 years, the Yellow River has been the lifeblood of Chinese civilization. Today, the Yellow River is still a major source of water to 100 million people in nine Chinese provinces. Therefore, it is essential that the river continues to flow for many years to come. Regulating the Yellow River's awesome power is the responsibility of the Yellow River Conservancy Commission, an agency of the Ministry of Water Resources of the People's Republic of China.

To assist in this monumental task, the commission implemented a plant intelligence and supervisory control system from Wonderware, a business unit of Invensys. This system features the Wonderware Industrial Application Server, InTouch human-machine interface (HMI) software and SuiteVoyager portal software.

The objective of the project was to create a large-scale operating system — including a central database, real-time information transference and processing — and decision support distributed over 700 kilometers of the Yellow River. It had to effectively regulate water quantity and prevent flow stoppages, particularly during droughts. It was also designed to help commission staff forecast floods and create proactive flood progressing models.



The Yellow River Conservancy Commission selected a Wonderware solution primarily because its underlying Archedra technology enables Wonderware software to integrate well with most of the hardware, software and applications in industry today, regardless of the vendor. So the commission could derive all of the benefits of the groundbreaking Archedra technology and preserve its existing technology investments. The Yellow River staff has also appreciated the excellent pre-sale and after-sale technical support from Wonderware's staff and worldwide distribution team.

With the help of the Wonderware Industrial Application Server, the Yellow River Conservancy Commission regulates 700 kilometers of water and 43 sluice stations from a central control room.



An operator accesses the Yellow River's plant intelligence and supervisory control system through the Industrial Application Server Integrated Development Environment.

Wonderware excels at precisely the type of distributed system that the Yellow River Conservancy Commission required. In fact, with the help of Utitech Technology Co., the Wonderware Distributor in Beijing, the entire system implementation took only three months.

"After conducting an extensive survey, we chose Wonderware's FactorySuite A² solution based on ArchestrA technology," said Mr. Zhu Chenhua, director of the Yellow River Conservancy Commission's information center. "In the sluice stations, we installed stand-alone InTouch nodes. For the other 4 levels — counties, cities, provinces and the water regulation center — we adopted the Industrial Application Server featuring ArchestrA technology."

Industrial Application Server Drastically Accelerates System Growth

The Wonderware Industrial Application Server is central to this particular solution because its ability to deploy multiple instances of plants and objects over different applications can decrease the engineering and maintenance costs involved in building the pipeline system.

The Industrial Application Server is built on the ArchestrA industrial automation and information software architecture, which is based on Microsoft's .NET framework. These technologies enable the Industrial Application Server to facilitate easy installation, operation, modification, maintenance and replication of automation applications and virtually instant integration of application information.

The Industrial Application Server is the ideal product for the water regulation center because it provides an Integrated Development Environment (IDE); the ability to create a logical model in the control system based on the physical location of plant equipment; object-based development; integrated and centralized security down to the data level; flexible data connectivity; application run-time management; centralized diagnostic utilities; and tight integration with other Wonderware products and third-party products.

The ability to easily create and reproduce ArchestrA Objects greatly simplifies the Yellow River staff's ability to quickly deploy applications across the control system, which spans several thousand kilometers, yet consists of identical equipment per pipeline control station.

Rapid Deployment Decreases Costs

This highly efficient method of object propagation markedly increased the speed of system deployment and significantly decreased the engineering costs associated with building the new system.

"The advanced functionalities of the ArchestrA technology, such as reusable objects, modularized technology and remote deployment ... made it possible for us to complete the first phase of this system in three months, which includes 43 sluice stations," said Chenhua.

This groundbreaking approach to engineering meant that the commission did not have to invest in the many hours of system programming that this project would have otherwise required — saving this project and the commission as a whole a significant amount of money. Furthermore, the reusable nature of the application objects created during the system's development will save the plant additional hours and expenses in ongoing system maintenance and expansion.

SuiteVoyager Portal Provides Valuable Reports

Wonderware's SuiteVoyager portal software made it possible for the Yellow River's plant personnel to securely share information over the Internet, regardless of their locations along the lengthy river. They can access the latest upstream, downstream, statistical and field-related reports in real time. In addition, designated staff members can create reports and fine-tune who can access each report.

Moreover, the SuiteVoyager software can send important alarm information related to water levels, system issues, insufficient water flow, high sediment levels, unauthorized water diversion, etc., and enable the

commission staff to take the appropriate corrective actions without leaving the center or even using the telephone. Plant operators can remotely adjust sluices to bring water flow back within margins.

Pure, Flowing Water

The Wonderware plant intelligence and control system helps the commission continuously purify the river water by removing sediment and other contaminants, increasing water availability, and reducing the likelihood of floods with the use of stream banks and aquifers.

"With the help of this modern monitoring system, we have improved the Yellow River's water regulations," said Liu Xiaoyan, director of the Water Regulation Bureau of the Yellow River Conservancy Commission. "With the expansion of this system, we can ensure that the river will not dry up. We can make The Yellow River more beautiful and younger, and bring more benefit to Chinese people along the Yellow River."

Today, the banks of the clean, flowing Yellow River are home to a variety of recreational activities, such as fishing, camping, picnics and other enjoyable pastimes. Moreover, the river also provides a habitat for diverse plants and healthy fish, and offers water and shade to wildlife and livestock.

With the highly beneficial Wonderware plant intelligence system, China's Yellow River is now poised to make history again -- by becoming the most advanced water regulation system in China.

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