

Transferring water on the land of Saudi Arabia

Did you know that many countries do not have perennial streams? Among them, the Kingdom of Saudi Arabia is probably the most famous one. The country has one quarter of the world's proven oil reserves¹, but it only receives an average of about four inches of rain a year, one of the lowest in the world².

In such a country, it is challenging to develop agriculture. Since the 1970s, the government has vigorously promoted modern agricultural technologies. The development of irrigation networks was one of the initiatives. Thanks to 40 years of continuous development, water is now distributed through thousands of miles of irrigation canals and water pipelines in the country, bringing productive agriculture to vast tracts of the land³.

Siemens has cooperated with Sinopec Oilfield Service Corporation (SSC) to build an automated water pipeline from Al-Khobar to Al-Hasa for the Ministry of Agriculture of Saudi Arabia. This project helped realize efficient transfer of irrigation water and benefitted the local farmers.

"Blood vessels" for the land

Much as the heart distributes oxygen-enriched blood around the body through blood vessels, Saudi Arabia delivers treated water throughout the country via a network of water pipelines. For this country, water is as precious as gold.



The interior of the pump station of the treated water transfer project of the Ministry of Agriculture of Saudi Arabia

Therefore, for the construction of water pipelines, the Ministry of Agriculture raised a quality requirement that was even more stringent than that for oil pipelines. The owner hoped that SSC and Siemens could build a high-quality water pipeline that could run stably in a long term with automatic operation and management.

Based on the demands of the owner, Siemens cooperated with

SSC to build two pump stations, one control center in a pump station, five remote terminal stations and one operator station. Siemens, as the main

¹ The Embassy of the Kingdom of Saudi Arabia in the United States. About Saudi Arabia: Energy: <https://saudiembassy.net/energy>

² The Embassy of the Kingdom of Saudi Arabia in the United States. About Saudi Arabia: Agriculture & Water: <https://saudiembassy.net/agriculture-water>

³ The Embassy of the Kingdom of Saudi Arabia in the United States. About Saudi Arabia: Agriculture & Water: <https://saudiembassy.net/agriculture-water>

automation vendor (MAV), delivered the Totally Integrated Automation solutions including the PCS 7 control system, motors, industrial switches and others.

In the project, Siemens applied the PVSS software, which was also applied in the West-East Gas Pipeline Project in China. It was able to efficiently support a large-scale system and monitor and coordinate various parts of the system. Thus, it improved the automation level of the pipeline itself, as well as that of pipeline maintenance and operation management.

Eventually, thousands of input/output (I/O) points were installed along the pipeline by SSC and Siemens. These I/O points could transfer data of each section of the pipeline, such as the pressure and the flow, to the control center in real time. According to actual water demands, the control center would then centrally manage different components of the system, such as the valves of the pump stations. In this way, the maintenance costs were greatly reduced and the pipeline could also operate smoothly for a long time.



The staff is checking the operation status of the equipment in the control center at the pump station.

The project was put into operation at the beginning of 2018. As of mid-2018, the pipeline has been working efficiently.

A partnership that maximizes values

This is the first overseas project of cooperation between Siemens and SSC. It helps SSC successfully open up the market of Saudi Arabia.

Xue Junxiang, Purchasing Manager of Sinopec Oilfield Service Corporation, said, "Since the project involved not only implementation but also long-term operation and maintenance, we hoped that our partner could provide comprehensive services to improve project efficiency. Siemens fully met our requirement for an excellent partner. In addition, its local production system and global sales and service network have helped us save costs in production and communication."

During execution of the project, SSC and Siemens worked closely together to maximize the value for the owner. For example, SSC and Siemens invited the owner to a Siemens factory in China to demonstrate the production processes and explain Siemens' solutions in detail. This move helped to win the trust of the owner. In addition, as the owner had strict requirements for motor testing, Siemens, in cooperation with SSC, added some test items even after the products had left the factory, thus satisfying the owner's requirements.

"The delivery time of such project is generally about four months. However, in

this project, it was as long as three years,” said Zhao Junming, Key Account Manager of Oil and Gas Industry in Process Industries and Drives Division of Siemens China. “Over the three years, we maintained close communications with SSC to respond to the owner’s needs as quickly as possible. We believe that the good cooperation will create more possibilities for our future collaboration.”

With the development of the Belt and Road Initiative, more and more Chinese companies are going global. The completion of this project is not only of pioneering significance for SSC, but also marks another best practice of Siemens exploring overseas markets together with Chinese companies.