ULTRASONIC FLOW METER METERING SKIDS FOR ZHUHAI-ZHONGSHAN PIPELINE

One of the first turnkey project in China

With the rapid development of the Chinese gas industry, China has had to speed up the exploration and development of several offshore gas fields, in addition to implementing its dedicated onshore pipeline projects. Elster-Instromet was awarded the contract to provide five sets of metering skids for the Zhuhai-Zhongshan pipeline. The owner of this project is CNOOC Guangdong Gas Co., Ltd.

The Zhuhai-Zhongshan pipeline project includes one trunk pipeline and four branch pipelines with a total length of about 110 km. The gas transmission capacity amounts to 15 x 10^8 m^3/a and the rated pressure of the pipeline is 7.8 MPa. The Zhuhai-Zhongshan trunk pipeline starts at Hengqin first station which is located on Hengqin island and passes by the towns of Nanpin, Tan-zhou, Sanxiang and Tangjiawan, arriving finally at Nanlang. The trunk line, which is made of L450NB(X65), is 49.6 km long and has a diameter

of DN = 660 mm. It comprises three stations and three block valves stations. The Hongwan branch pipeline extends to Hongwan Power Plant terminal station. It is 3.4 km long, with a pipe diameter of DN = 323.9 mm, and is made of L320NB(X46). It features one terminal station and one block valves station.

Fig. 1: Hongwan Power Plant station

The Hengmen branch pipeline leads from Nanlang offtake station to Hengmen Power Plant terminal station. This branch line, which is made of L450NB(X65), is 13.4 km long and has a pipe di-ameter of DN = 660 mm. It features one terminal station and one block valves station.

The Macao branch pipeline and the Lingang branch pipeline will be installed in phase II of the Zhuhai-Zhongshan pipeline project. The Macao branch line is 8.5 km long with a pipe diameter of DN = 324 mm, the material of the pipe being L320NB(X46). It will have only one station, i.e. Macao terminal station.

The Lingang branch pipeline will lead from Hongwan offtake station to Lingang terminal station. This branch line is 36 km long and has a pipe diameter of DN = 508 mm, the pipe being made of L450NB(X65). It will have one terminal station and four block valves stations.

The configuration of the five measurement stations involved are described below, and two typical stations are illustrated with pictures:

1. Hengqin first station: One gas chromatograph + one moisture analyzer + one H_2S analyzer
Elster-Instromet supplied the customer with an analyzer cabin with one gas chromatograph set, one moisture analyzer set and one H_2S analyzer set.

2. Nanlang offtake station:
DN150 two ultrasonic flow meters
Collect natural gas transferred from Hongwan offtake station and transfer the gas to Zhongshan city gate station following filtering, metering and pressure regulation. The metering skid in Nanlang offtake station uses two Q.Sonic-4C ultrasonic metering runs, one of which is for normal operation while the other one is intended for stand-by use.

3. Hongwan offtake station:
DN150 two ultrasonic flow meters
Collect natural gas transferred from the first station and transfer the gas to Zhuhai city gate station following filtering, metering and pressure regulation. The metering skid in Hongwan offtake station uses two Q.Sonic-4C ultrasonic metering runs, one of which is for normal operation while the other one is intended for stand-by use.

4. Hongwan Power Plant terminal station:
DN200 two ultrasonic flow meters
+ one gas chromatograph
Collect natural gas transferred from the Hongwan offtake station and transfer the gas to Hongwan Power Plant following filtering, metering and pressure regulation. The metering skid in Hongwan Power Plant station uses two Q.Sonic-4C ultrasonic metering runs, one of which is for normal operation while the other is intended for stand-by use.

Fig. 2: Hengmen Power Plant station

5. Hengmen Power Plant terminal station:
DN300 three ultrasonic flow meters
+ one gas chromatograph
Collect natural gas transferred from Nanlang offtake station, and transfer the gas to Hengmen Power Plant following filtering, metering and pressure regulation using a filter, flow meter and flow/pressure control system. The metering skid in Hengmen Power Plant station uses three Q.Sonic-4C ultrasonic metering runs, two of which are for normal operation while the third is intended for stand-by use.

The supplied metering skids were put into operation in January 2006. All units have been working properly since commissioning. During implementation of the project, the staff in the Beijing office have accumulated a lot of experience with regard to site installation, adjustment of gas chromatographs, moisture analyzers and H_2S analyzers, commissioning and after-sales service. Having enjoyed such a positive start, we are confident that we shall win other turnkey projects in the future.

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